NATURE MAGAZINE

APRIL 1928 VOL. 11, NO. 4

55 CENTS

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Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

AMONG the various activities of the American Nature Association, one that has gained widespread attention has been the campaign for the conservation of our outdoor resources and roadside beautification. Under the general head of Outdoor Good Manners,—an excellent slogan originated by Mrs. Francis E. Whitley of the General Federation of Women's Clubs,—the Association has been carrying on a nation-wide educational work. The national cartoon contest brought out some telling material and other information sent out has met with general use.

This campaign will be actively carried forward during the present year. Recently our president, Mr. Arthur Newton Pack, announced the policy of the Association in a radio address given through the courtesy of the Izaak Walton League of America.

"I am talking," he said, "to people who are, as motorists, lovers of good roads, smooth roads and beautiful roads. Counties, states, the whole nation are now cooperating for the improvement of our highways. Most of us have reason to be pleased with what is being accomplished, and community pride on the subject of good roads is wide-awake. America is also proud of its progressive business methods. America is known for its advertising; but are we proud of so many of our roadside landscapes walled with ugly signboards? Indeed, when we face the question most of us will agree that the roadside landscape is not the place for advertising, except perhaps in very limited commercial districts."

Mr. Pack continued to point out that the signboard problem has been dealt with to some extent as a menace at intersections and has here and there been ruled off where it bars a scenic beauty. This has solved the problem only partially, however.

"There are some," Mr. Pack continued, "who *would* favor the placing of billboards and signs along rural roads for a certain distance outside of city limits, but what is the result of this policy? The approaches to your city become veritable motor slums, and who gains? No one but the men who erect and rent the boards. When the tourist enters a city through a lane of billboards, he can not pick out his hotel or restaurant therefrom, because of the very multitude of names offered. He drives around and selects the best looking place and goes in. The great number of signs is apparently killing the value of all.

"The States of Maryland and Connecticut have shown us one way of going about it. This way lies in roadside tree planting. A highway lined on both sides with trees, planted and protected by the State Highway Commission or Forestry Department, or under the auspices of County Shade Tree Commission such as we have in New Jersey, is poor meat for the outdoor advertiser. Trees obscure no view of landscape. They rather frame it. But rows of trees do make it hard to read billboards, as advertisers well know. It is illegal in both New York and New Jersey, as well as in most other states, to attach signs to trees. Many states have already passed laws forbidding advertising signs on rights of way.

"Moral suasion has gone far in convincing prominent corporations that rural billboard advertising, alienating as it does the good will of a considerable portion of the motoring public, should be given up or greatly decreased.

"The tree planting plan meets all objections that have been urged against other anti-billboard devices. Let me urge every one to help develop and express public opinion for a landscape free from advertising. If you want help or further advice, write to the National Committee for the Restriction of Outdoor Advertising, 119 East 19th Street, New York City."

As announced in the March issue the above cartoon has been brought out in a form large enough for posting and is available from the American Nature Association *in lots of fifty or more* at one cent a poster.

The new way to know Trees

YOU can now know the delight of personal tree growing. It puts beauty into your surroundings—gives you outdoor pleasure—and it is a gilt-edge investment.

The delightful practice of tree growing is so easy by this plan of the Living Tree Guild. And you can be *sure* of success! For if you report that any of your Guild trees are not flourishing, they will be promptly replaced during the year without cost to you.

No investment bond ever increased more surely or rapidly in value—nor yielded better dividends—than does a young growing tree. A few years from now you will behold the few dollars invested this year in Guild Trees grown into many added dollars of value!

THESE are FOUR YEAR OLD TRANSPLANTS (Averaging 6 to 12 inches tall on delivery). The special packing of sphagnum moss keeps these trees absolutely fresh. The life of each tree is insured for the entire year. That is how the Guild backs you up.

TWELVE BEAUTIFUL NORWAY SPRUCES only $3.95 for all

TO get the best results you should buy trees by the root systems. They are not a standardized product. Their early life determines the value of their future. Many influences affect them—quality of seed, kind of soil, manner of transplanting and root-pruning, and climate.

The greatest asset of a tree offered for sale is the knowledge and integrity of the people who have produced it. Guild Trees are produced under such conditions that every one is *covered by Life Insurance* and will be replaced within the year without cost if it should fail to thrive.

Instructions for planting with each shipment

This stock of Guild Trees has been inspected by the Department of Agriculture and a certificate of inspection issued. With each shipment there are clear instructions for planting and suggestions for the many uses of these delightful spruce trees.

The low price of these trees conforms with the purpose of The Living Tree Guild to promote tree growing among a large number of individuals. Thus to teach the joy and value of trees by *practice* and not by theory. Won't you make this modest investment? It will bring you much pleasure and profit.

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Send for our Free booklet, "Plant Your own Trees and Save 90%"

The Living Tree Guild, Dept. 64, 468 Fourth Ave., New York, N. Y.

Please deliver ONE DOZEN Norway Spruce 4-year transplants. **GUARANTEED!** If $3.95 is not enclosed herewith you may send C. O. D. **No extra charge for packing and delivery.**
(Please print name distinctly.)

Name.....

Address.....

City..... *State*.....

( ) Check here if you want **Two Dozen** for **$7.50.**

( ) Check here if you want **One Hundred** for **$25.00.**

THE LIVING TREE GUILD

National Headquarters for Guaranteed Living Trees

468 Fourth Avenue *(at 31st St.)* **New York, N. Y.**

Ten Forests Surround Yellowstone

The Greatest Recreation Area in All the World Invites You

Fourteen Million Acres—Yellowstone Park in the Center—Ten National Forests Surrounding.

In this vast, beautiful, mountain paradise there are today luxurious hotels, rustic mountain lodges and "Dude Ranches" where guests are hospitably welcomed.

Do you seek rest and inspiration in the mountains? Does outdoor adventuring and sight-seeing in the West appeal to you? Here one can find these things and more—Wonders of Yellowstone in the center—geysers, hot springs, boiling pools, cataracts, Grand Canyon—and grouped about are mountains, rivers, lakes and trails of *ten National Forests*.

Wilderness to explore—trout fishing—horseback riding—hiking—restful reading and inspiration if you prefer, or vigorous Western ranch life—beauty everywhere.

We will be glad to help you plan a trip to this greatest recreational region which you own and should take advantage of.

Northern Pacific Ry.

Mail this coupon to E. E. Nelson, P. T. M., 627 Northern Pacific Bldg., St. Paul, Minn.

I am interested in Yellowstone Park and the National Forests surrounding it. Please send descriptive booklets and rates for a (√) Yellowstone ☐ or a National Forest Vacation ☐ or both ☐.

Name .....

Address .....

My telephone number is .....

If student, state school and grade .....

NORTHERN PACIFIC YELLOWSTONE PARK LINE

81

The "North Coast Limited" Sets the Pace Out West!

Readers of this column are urged to write to the Travel Editor for any information desired relative to travel, whether it is for short distances or long distances. To every inquirer will be sent, by return mail, some definite information and this will be followed by special literature regarding the places about which they desire information. This department is designed to be of direct personal service to the readers of this magazine.

Easter is almost here, and with it the time of relaxation between the closing of winter and the beginning of spring duties. A rest and change of air at this time of the year are particularly appreciated. Appropriately, in addition to their regular cruise, the Ward Line is instituting a Special Teachers and Students Nine Day All-Expense Cruise from New York to Havana and return. This allows for three days sea-voyage in each direction, and three days sight-seeing in Havana. The city, foreign in atmosphere and with many historical associations, has a tropical climate and a beautiful situation which have added to its fame.

* * *

If one desires to visit a warm climate without the sea voyage Florida has much to offer. The palm trees and gloriously colored foliage should delight an enthusiast who relishes seeing the brilliant patterns that Mother Nature can weave around the setting of blue sea and sky. Railroad accommodations and connections are easily arranged from northern cities, and overnight the traveller will find he has been transported to a country of delightful warmth, sunshine and numerous diversions.

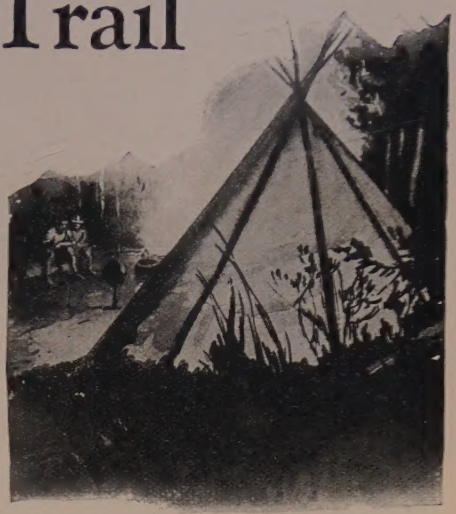
* * *

For many years at the Easter season Washington, D. C. has been the goal of people from all over the United States. At this time the cherry blossoms around the Potomac Basin are in bloom, and form an Oriental frame for reflections of the beautiful Lincoln Memorial and the Washington Monument. Three thousand of these trees were presented in 1912 to the city by the Corporation of Tokio, Japan, as a token of good will and esteem. They usually blossom in the early part of April. The many excellent railroad lines between Washington and all parts of the country, make the city easily accessible to visitors from North, South and West.

* * *

After Easter comes the return to normal before the spring fever epidemic sets in, and the wanderlust indiscriminately grips us all. Those are the days when our thoughts turn to making plans for the summer trip. Where are you going this year? Anticipation is admittedly a great part of the enjoyment of

An Invitation to All Who Long for the Forest Trail



BACON sizzling on a pointed stick! Corn, potatoes and apples roasting in the ashes! Indian maize cakes browning in the skillet! Does any food ever taste as good as this?

Everybody longs to get out in the woods and wild places now and then. But do you know that camping pleasures increase in direct ratio to the camper's knowledge of how to live in the open —of what to see and where to see it?

The American Indians were the supreme authorities on open air life—on hunting, fishing and camping. From them the pioneers learned the twin sciences of woodcraft and campcraft.

Ernest Thompson Seton has studied the lives of the Indians and pioneers more carefully than any other writer. In six of the most valuable and fascinating books of their kind ever written, dealing with Hiking and Canoeing, Animals and Birds, Indian-craft, Woodcraft, Earth and Sky and Wild Animals, he has incorporated a vast wealth of knowledge that represents years of painstaking study and research.

The Library of Pioneering and Woodcraft

by Ernest Thompson Seton

SIX volumes of woodland lore woven into the most thrilling of adventure tales comprise the Library of Pioneering and Woodcraft. Stories about people who lived in the woods by themselves. Stories about wild and domestic animals. Accurate information about how the Indians lived, fished, hunted, tanned skins, preserved meat, ground maize, made bows, arrows and implements. Indian stories.

DO YOU KNOW:

- How to make a fire without matches?
- How to build a waterproof shelter?
- How to find food and remedies?
- How to make knots, traps?
- How to know birds, animals, trees?
- How to hunt, fish, travel, cross streams?

Examine These Wonderful Books FREE

It is impossible to tell you here of all the fascinating and valuable information, all the thrilling stories that are contained in The Library of Pioneering and Woodcraft. We want you to see these books yourself.

With no obligation and at our expense, we will gladly send them to you for five days' free inspection. Simply mail the coupon and the six volumes, tastefully bound in dark green cloth and profusely illustrated, with photographs and drawings by the author, will go forward to you immediately. You can either return them within five days at our expense, or send only $1.00 as first payment and then only $2 a month until a total of $11.00 has been paid, an astonishing low price for books of such interest and value.

These books contain a world of pleasure and information that will appeal to everyone that loves the out-of-doors. No risk. No obligation. Mail the coupon NOW!

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Garden City, N. Y.

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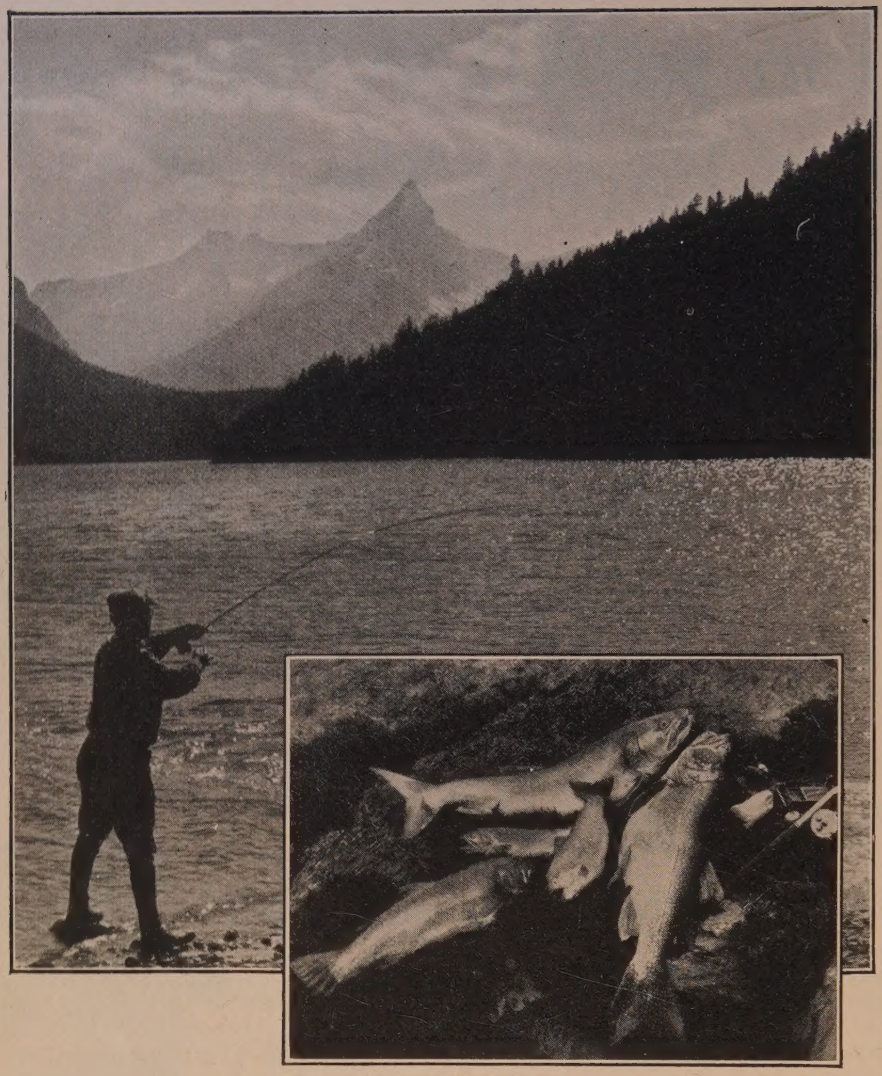
City.....

State.....

Occupation.....



There are plenty more like this in

Glacier National Park

Come out this summer and try your black gnat in Lake Josephine or other snow-fed lakes and streams in the Park. Go camera-hunting for Rocky Mountain goats and bighorn sheep. Hike or ride horseback through valleys of wild flowers, explore interesting glaciers. Modern hotels and chalets provide every comfort.

The New Oriental Limited takes you direct to the gate of Glacier National Park, which, with Waterton Lakes National Park just across the boundary in Canada, forms a vast *international* playground. Special low summer fares. Inquire today.

GREAT NORTHERN

ROUTE OF THE NEW ORIENTAL LIMITED

Mail the Coupon

A. J. Dickinson, Passenger Traffic Manager N-4
Great Northern Railway, St. Paul, Minn.

Send me free books describing recreation in Glacier National Park.

- ☐ General Tour of Parks
- ☐ Pacific Northwest Coast Tours
- ☐ Burlington Escorted Tours

Name_____

Address_____

GREAT NORTHERN

A dependable railway

anything, so let us look over this year's prospects, decide on what most appeals to us, and then have all the joy of planning and anticipating a glorious summer.

* * *

It has become quite the vogue in arranging European trips to plan on making use of the splendid aeroplane services now in operation. These enable the traveller to cover the longer trips from one city to another in the shortest possible time, thus leaving him more time to devote to becoming acquainted with the places and things he really wishes to see. The Allen Tours have available some interesting literature describing trips covering the whole of Europe by Plane and Motor. This combination is ideal, the tours are well and comprehensively arranged, and the rates are extremely reasonable.

* * *

In relation to Motor Tours, it will undoubtedly please many to know that Director George Weber, of the Deutschen Touring Club of Munich, was in this country completing arrangements of interest to American automobilists. He succeeded in minimizing the Customs and other difficulties which face the American tourists, 3000 of whom took their cars with them last year across the Atlantic. The Hamburg-American Line is provided with route card and information for those interested in motoring through Central Europe.

* * *

Those who plan a summer trip on this side of the Atlantic, whether by train or motor, will find any of the National Parks a paradise for nature lovers. Some of these parks are noted for their canyons, some for mountains and lakes, some for geysers, but all share the fame of natural beauty. All are animal sanctuaries. In them are to be found deer, bear, mountain sheep and goats, beaver, and smaller forms of wild life. The animals and birds, knowing they are protected, are therefore fearless to a certain degree, and roam about to the delight of the tourist. For study of wild life, for enjoyment of camping, or for scenic wonders, our National Parks are unexcelled.

* * *

The Lloyd Sabaudo Line has launched a new liner, the *Conte Grande*, to enter the New York-Mediterranean service. Unlike the usual itinerary of steamers westbound from Italian ports, she will stop at Gibraltar. This will enable American tourists who complete their European travels in Spain, to take the direct six day liner from Gibraltar to New York. The *Conte Grande* is expected to be the fastest ship in the New York-Mediterranean service. She has a 26,000 gross tonnage, and will sail from Genoa, touching at Naples as well as Gibraltar.

* * *

Another announcement of interest to European travellers has been made. The Compagnie Internationale des Wagons Lits has acquired the business of Thomas Cook & Son. The former concern has restaurant, and sleeping cars all over Europe. The two concerns will continue to work as before, but there will now exist a cooperation which will result in superior service.

KEEPING QUALITIES OF PRINTS

Prints that are properly made should never fade, change color or develop discolored spots. If any of these things happen it is a result of carelessness in the making of them. In the first place the developer should be made up absolutely according to the formula given by the manufacturer of the paper and a single batch of it should never be used to develop more than twenty-five or thirty prints. As soon as it becomes discolored it should be thrown away and a new batch made. After development the prints should be placed in an acid short stop for a few minutes before removing to the hypo. This removes or neutralizes the alkali carried in the print from the developer and which, if carried direct to the hypo bath, will render it in a short time unfit for further use. The prints should be allowed to remain in the hypo at least ten minutes and should be frequently moved about in order that the hypo solution should act equally upon all parts of the print. The forming of round spots on the print is caused by air bells that occur between prints in the hypo bath. Of course the temperatures of the developing and fixing baths should be as near equal as possible. Insufficient washing is probably the cause of more print failure than any other reason. Prints should be carefully separated when put into the water to wash and should be kept moving as much as possible. Unless every particle of both developer and hypo is removed the prints are bound either to fade or spot in time. Of course running water is the best if it is running in such a manner as to keep the prints constantly separated. If running water is not used then they should be washed in at least six to eight changes of water and should be moved about frequently in each. They should be washed for at least one hour. If one's work is worth keeping he will find that it is well worth his time to carefully observe all these rules.

What is the best type of motion picture camera for use in wild life photography? Is the range-finder a necessary adjunct in obtaining the correct focus? Does the spy-glass view-finder have any advantage over the open type? Which width of film gives the best definition? J. M. H.

For making motion pictures of wild life the type of camera that can be held in the hand and used almost instantaneously at any angle has, in my opinion, a very great advantage over any other type. Its only disadvantage is the inability of the average user to hold the camera absolutely steady during the exposure. Steadiness is necessary if a picture would be completely sharp cut and clear when enlarged many diameters upon the screen.

The range-finder is almost indispensable with which to judge distances properly for no one can do so with absolute accuracy

America's Supreme Vacationland
The Union Pacific West

Yellowstone . . Pacific Northwest and Alaska
California . . Colorado . . Salt Lake City . . Ogden
Zion-Grand Canyon National Parks

More scenic grandeur, more strange displays of nature's forces, more variety of man-made attractions await you in this western wonderland than anywhere else on earth. Among them are mysterious geysers, vast wild animal and bird refuges, lofty mountains, great glaciers, enchanting waterfalls, lovely lakes, tremendous colored canyons, virgin forests, ancient ruins, a thousand miles of Pacific beaches, dude ranches, cities great and gay. All or any of these western wonderlands may be visited easily, quickly, inexpensively on the fine, fast and frequent trains of the Union Pacific System, either independently or by Escorted All-Expense Tours.

Low Summer Fares and Famous Trains to all the West

Whether your vacation period is two weeks or two months, Union Pacific travel experts will gladly plan for you a complete itinerary that will suit your purse and give you a maximum of sightseeing.

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Please send me complete information and booklet.
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City ---------- State ----------

UNION PACIFIC
THE OVERLAND ROUTE

with the naked eye. If the scale of distances on your camera is correct, and this you should be sure of by testing, you will be able to obtain an absolutely sharp focus by means of the range-finder. When focusing upon the ground glass screen it is well to use a magnifying glass in order to be certain that the focus is sharp. The spy-glass view-finder is far superior to the open type in my opinion.

I do not think that there is any difference in the quality of the film, so far as clearness and definition are concerned, between the 35 mm. and the 16 mm. The picture, so far as these qualities are concerned, depends entirely upon the correctness of the focus and this depends, almost entirely, upon the man behind the camera.

Is it possible so to arrange a No. 2A Brownie camera with a flashlight that animals may take their own pictures at night? H. M.

Yes, this may be done with an Eastman flash pistol by means of a mouse trap of the type that catches the animal between a spring loop of wire and the board. The shutter is set for as slow a snap as possible and a thread drawn taut from the shutter release to the loop of the trap. Another thread is drawn, slightly looser, from the trigger of the flashlight pistol to the loop of the trap. When the animal pulls upon the bait attached to the pedal of the trap the loop is released which, in snapping downward, pulls the shutter release thread, being the tightest, first, instantly followed by that attached to the flashlight pistol. The adjustment of the threads must be absolutely accurate else the flash will come either too soon or too late. Also, naturally, the bait must not be attached directly to the pedal of the trap else the animal, if it be a small one, would be killed. It should be tied to a piece of string a foot or so long leading to the pedal of the trap and the latter so fastened that the slightest

Lovers of Romance Mystery & Wonder *come to* SOUTH AFRICA

HERE you can find a new, fresh, ever-varied and delightful panorama of changing scene and life.

Here you will experience pleasures and thrills that will cheer your heart and remain ever a delight in your memory. South Africa is a veritable treasure house of fascinating wonders—a Pandora Box from which your hands will draw out, every moment, some new and wonderful happiness,—a continuous round of charms which never pall or cloy.

South Africa is a land of invigorating climate, where life is full of song and pleasure. Here modern civilization moves cheek by jowl alongside of picturesque, quaint, dignified native Kraal life. Side by side with modern surgery witch doctors still ply their craft.

You will find many things you have never seen and can only find in this ancient land famous for its legendary history:

Great Diamond Mines
Mile Deep Gold Fields
Mysterious Zimbabwe Ruins
The Magic Cango Caves
Barbaric Bantu War Dances
Quaint Kaffir Kraals
The Mighty Drakensberg Mountains
Wonderful Victoria Falls
Speedy, Preening Ostriches
Kruger Big Game Park
and Glorious Cape Peninsula

Surf bathing on unrivalled sea-beaches.
Sea angling from rock bound coasts for the finest sporting fish of the world.
Trout fishing in Golden Rivers—the angler's paradise.
Golf on sporty courses midst nearby towering mountains.
Year round outdoor tennis on fast, true, ant-heap courts.
You travel on comfortable railroads or along fine motor roads with modern hotels to rest in.

Write for detailed information and free booklet, "Johannesburg" or send 12c (to cover postage) for fully illustrated travel literature.

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South Africa

3-2-28

The BIG FELLOWS await you

SALMON - BASS - TROUT

abound in the thousand lakes and streams of AROOSTOOK – the Inland Empire, in the Great Maine Woods.

In all the world no places excel Fish River Lakes – The Allagash – Moosehead or The Penobscot, etc., for fishing or vacation. All are on

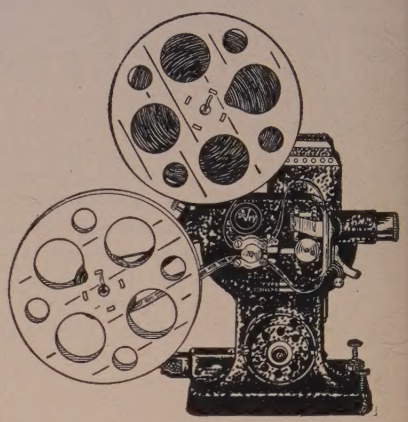
The IRON TRAIL of the BANGOR & AROOSTOOK the easy, convenient, comfortable, free from care and worry way, to get there.

IN THE MAINE WOODS—a magazine of 160 pages, 70 illustrations and articles by folks who enjoy the Great Out Doors, as yourself—will be mailed on receipt of 10 cents in stamps. It also contains rates and detailed information on hotels, camps, etc.

BANGOR & AROOSTOOK R. R.
Passenger Dept.
56 Graham Bldg.
Bangor, Maine
128

BANGOR AND AROOSTOOK RAILROAD

All Outdoors *on your own* Magic Screen



THIS new DeVry projector brings all outdoors to your living room in movies as sharp, as brilliant, as true to life as those you see in the theatre. You are not limited to the movies you take yourself. The world's most famous "wild life" and "nature" films are available for you to show. Go to your camera store today and see the DeVry demonstrated—or write the DeVry Corporation, Dept. 4-B, 1111 Center Street, Chicago, Illinois, for Free book.

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"Hollywood's Own"

Used & New Field Glasses

Pocket size prisms in 3½, 4, 5, 6, 7 & 8-power, 3 to 12 oz. weight; $10 to $35. Zeiss, Hensold (including "Dialyt"), Mirakel, Busch, Schutz, Lemaire, Atco, Colmont and Megaphos. Galilean or "field glasses", $3 and upward. *Satisfaction guaranteed.* Sent on approval.
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We make enlargements from your negatives—on a money-back basis. Send for our prices and guarantee . . . or send us one dollar with your best negative for a 10 x 12 "Old Master". We will immediately refund your money if the enlargement is not in every way satisfactory and is returned to us within five days. C.O.D. orders filled.
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37 Days EUROPE $295

SAVE 30%
200 All Expense Tours. First class Hotels. Motor Tours as low as $7 a day. Booklet 200 Allen Plan Tours FREE
Allen Tours, Inc.
154 BOYLSTON ST. BOSTON

tug will release it. Of course the camera should be focused upon the spot where the bait is fastened.

The Imperial Brass Manufacturing Co., of Chicago, Ill., used to manufacture a flash gun called the "Imp Flashlite Gun" which was excellently adapted to this style of photography. I fear, however, that it is no longer on the market.

* * *

Photographic Department

The filming of a private ape colony, composed of 130 simians of 25 species, and owned by Madame Rosalie Abreu, of Havana, Cuba, was recently completed by Pathe Exchange, Inc., for educational work in the Division of Anthropology of Harvard University. There were nine spider monkeys, which have no thumbs, a black ape from Borneo, the only specimen in captivity, and a Barbary ape from Gibraltar among the collection.

* * *

William Beebe, naturalist, has recently returned from exploring the ocean bottom of the Caribbean, in Haiti Bay, and is exhibiting several reels of moving pictures of marine life which he took with an amateur standard film De Vry camera 60 feet beneath the surface. He explored a strip of the sea floor more than five miles long with his camera. Mr. Beebe plans to have a transparent cage, made of alternate strips of glass and celluloid and seven inches thick, constructed for him, so that he may descend one mile under the surface of the ocean, to study the forms of sea life existing at these depths.

See Results
of Photo Contest

8 POWER $9.85
DAY AND NIGHT LENSES
LIFETIME SERVICE

A powerful and accurate precision instrument at an unusually low price.

GERMAN FIELD GLASSES

A World Famous SA *Product*

Many thousands of lovers of the great outdoors use and swear by this popular Field Glass.
Objects 10 to 20 miles away appear 8 times nearer. Experienced sportsmen say "next to a good gun—the most essential part of the hunter's equipment."
Made according to strict specifications of military engineers. Sold by sporting goods, optical, and camera supply stores in the U. S. A. and Canada, or sent postpaid on receipt of check, money order or C. O. D. The S & A guarantee means full cash refund if not satisfactory.
Our expert repair department will submit estimates on glasses sent in for repairs
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HENSOLDT catalog showing improved DIALYT
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GRAFLEX

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"IS THE COAST CLEAR" LYNWOOD M. CHACE

NATURE MAGAZINE

PUBLISHED BY

THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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Nature Magazine, past and present, is indexed in the Reader's Guide in your library.

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter May 31, 1927, at the post office at Washington, D. C. Additional entry at Greenwich, Conn.

Subscribing Membership Blank will be found in the back pages of the magazine.

Publication and Editorial Office, 1214 16th Street, N. W., Washington, D. C. Additional Offices of Publication, Greenwich, Conn.

ADVERTISING OFFICES
New York—171 Madison Ave.
Chicago—Mather Tower Bldg.
San Francisco—Hunter-Dulin Bldg.
Los Angeles—Lincoln Bldg.
Seattle—Henry Bldg.
Atlanta—Grant Bldg.

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BLOODROOT—*Sanguinaria canadensis*

RED COLUMBINE—*Aquilegia canadensis*

WHITE TRILLIUM—*Trillium grandiflorum*

Why the Wild Flowers are Wild

by P. L. Ricker

President, National Wild Flower Preservation Society

Color plates furnished from the Wild Flower Preservation Society series by courtesy of Miss Catherine A. Mitchell

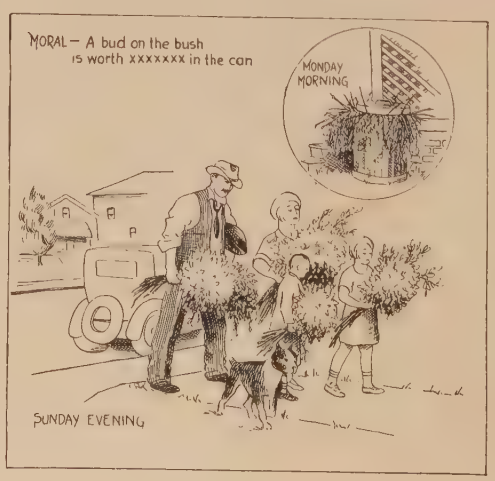
Multitudes of people who for the past six months have spent most of their leisure moments indoors, are now slowly emerging from their winter's inactivities and taking to the country at every opportunity. The roads are dotted with hundreds of automobiles and the woodland paths and nooks abound with pedestrians and picnickers, all adding their lunch papers, cans, bottles and boxes to a landscape not yet recovered from the recent roadside Christmas tree vandalism. With the already too numerous signboard atrocities and the rapidly increasing assemblage of abandoned auto wrecks it is small wonder that the wild flowers are wild, or that they can find space to rear their heads in a vain attempt to hide such odious companions.

Few can resist the temptation to pluck a handful of Nature's jewels, no matter how rare they may be, and as quickly discard their wilted forms along the way. Many of the spring flowers and especially those of the woodlands are particularly susceptible to destruction from too much picking. Comparatively few of the spring wild flowers are so rare in most localities that they should not be picked at all in order to maintain their normal supply and provide for a moderate increase, but in this class should be included practically all of the orchids.

One may readily judge most other flowers by their abundance as to whether they may be picked very sparingly, in moderation, or freely. For the extremely rare kinds certainly not more than one flower in ten should be picked and then rarely except for scientific purposes. Most of the middle group may have one in four or five picked with little danger of extermination. The last group include many extremely bad weeds, together with an abundance of attractive flowers, most of which it would be impossible to exterminate if one tried. The greater part of these belong in the family with the aster, daisy and goldenrod. The three following attractive subjects are presented in colors this month.

The Bloodroot, *Sanguinaria canadensis,* so called because of the reddish juice that exudes from the root and stem when broken, was used by the Indians as one of their war paints. It belongs to the Poppy family and is found in rich woods throughout the eastern states and as far west as Nebraska. The root is extensively collected for dealers in drugs for use in medicine. The petals vary from eight to sixteen and the leaves are much more erect than in most plants. The flowers lose their petals quickly after picking so that this practice should be discouraged and the flowers allowed to develop their seed to increase the supply.

The Red Columbine, *Aquilegia canadensis,* derives its common name from the Latin word for dove, owing to a fancied resemblance of the spurs to that bird, while the first part of the scientific name is derived from the Latin word for eagle, from a fancied resemblance of the spurs to an eagle's claws. It belongs to the Crowfoot family and there are about fifty species, mostly of white, yellow, red and blue colors, or often combinations of two of these colors, some of which are found in most parts of the country. On account of its adaptation to conventional designs, the fact that three of its colors are included in our flag, and because the spurs resemble the claws of the American eagle, it is being strongly advocated as a national flower and a society called the Columbine Society has been in existence for a number of years with that object in view. It has been adopted as the flower emblem of the Daughters of the American Revolution. In the present species the spurs are uppermost in the flower, but in some of the western species the spurs hang down. It is the former species that most resemble a dove. Many flowers that have been adopted as national or state flowers have on that account had their natural supply seriously depleted and it is hoped that before extensive inroads are made on the columbine supply, seeds of the native species will be available for cultivation, and care taken in their collecting so that enough seeds will remain in each locality to maintain the normal supply.



The White Trillium or Wakerobin, *Trillium grandiflorum,* belongs to a family of the latter name, closely related to the Lily family. About twenty-four kinds are known, some of which are found in most parts of the country. The prevailing flower colors are white, greenish and pink to reddish brown. In some of the species the flowers are practically without stems. In others the flowers, instead of widely spreading as in the above, remain practically closed most of the time.

NATURE CALENDAR

APRIL

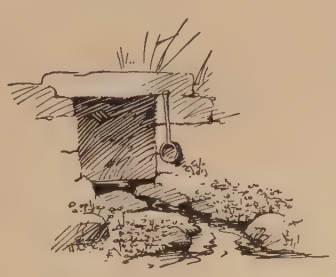
by E. Laurence Palmer

ROBINSON CRUSOE arrived on his island with a meagre supply of the material products of civilization. For some time he had to get along as best he could with things as he found them. We are told in our nursery days of how "he made him a coat of an old nanny goat" for example. DeFoe, the author of Robinson Crusoe, died in April. He probably had no intention of having his story used as an inspiration for Nature workers in this day and age. Neither would he object to its being so used, I am sure of that.

Our friend Crusoe and his man Friday had to secure most of the things which enabled them to live comfortably. These things included fibre for various purposes as well as food to satisfy their hunger. April is a rather satisfactory month in which we may examine the possibilities for fibre in the plants which we find on our spring hikes into strange lands. Try twisting some of the old dried stems of nettles or the bark of dogbane or milkweed into cords to be used as substitutes for machine-made cords. Edison and others are now using much effort in attempting to find some plant that will grow easily within the boundaries of the United States and will produce rubber and make us independent of the rubber trees that do not thrive here. How many of the weeds that you examine on April hikes possess a milky juice and might possibly help us in our need?

Most of us who attempted to get a meal from the wild in April would starve these days but even though we do get most of our supplies from the lunch basket we can spice things up with a nibble at some twigs of black or yellow birch. We can go to a spring and there possibly find water-cress growing as though there had been no winter. We may add a little pepper-root to our salad or sweeten our breath by chewing a little ginger-root or the seeds of the ever-present wild sweet clover. Little experiences such as these which are possible in April may make us feel some kinship for the ever popular Robinson Crusoe.

Should we suggest to many of our friends that they indulge in this sort of thing many of them would be haunted with the strangest of ideas. Like Don Quixote, whose author also died in April, they make giants out of wind-mills or the possibly more modern dragon out of the first garter-snake of the year. The pride with which many of these people tell of the bravery they displayed in killing harmless forms of life is almost as amusing as the absurd, cocky attitude of Don Quixote. This absurd pride of course is most evident when, in the fall, the army of armed hunters takes to the field, often with rare disregard of sportsmanship and conservation.



The northern migration of our water-fowl is fortunately no longer welcomed with a hail of shot. This April will see few ducks returning to their own death to help a wounded mate as used to be the case when spring shooting was permitted. Don Quixote's motives would hardly have permitted him to do some of the things done by thousands of hunters every year.

Readers of Nature Magazine would be glad to know that Don Q, the California quail that used to fight with the electric fan, is still enjoying the companionship of the Finleys in Oregon.

April is a month in which the need of a great variety of birds becomes evident. Woody plants of all sorts abandon the protection afforded by hidden and protected buds and send forth delicate, tender shoots that are subject to the attacks of all sorts of enemies. We need birds like the chickadees and warblers to help in this.

Many plants whose living portions retreated underground like the woodchucks and gophers are sending up delicate green tops that make excellent food for man, insects and beasts. Birds like the hawks and owls destroy many mice that would destroy these shoots and other birds like the quail help control the insects. It is fortunate that our bird population increases rapidly by recruits from the south during this most strategic month.

In April the banks of our trout streams become well worn by the paths of fishermen except in those parts of the country where the season is later. Not a few of these fishermen may get more Nature experiences than they do fish but strangely enough during this month they stick to the humble and time-honored earthworm as bait, irrespective of the fact that the stream may be well supplied with other creatures that the trout are feeding on. The crevices beneath stones perennially produce small forms of life which give the fishes their "bread and butter".

The edges of ponds not inhabited by trout will be seen to be alive with such insects as the plant-eating water boatmen and their larger and more vicious kin the back-swimmers. Like a very great number of the insects to be found in water these forms are breathers, securing their supply by coming up to the surface at variable intervals.

"SANDHILL CRANES DRIFT IN LIKE SLATY SHADOWS"

NATURE MAGAZINE

Volume Eleven

No. Four

April, 1928

SIR LONGSHANKS *the* BRAVE

The Story of the Wise and Wary Sandhill Crane

by Ben Hur Lampman

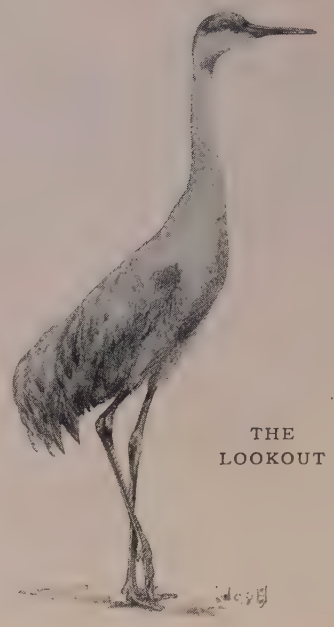
Illustrated by R. Bruce Horsfall

A VETERAN gander of Canada geese is very wise and uncommon wary, and there is no lesson that he has ever forgotten; neither the strange, unprompted lessons of species, nor those that are had of experience by perilous bargaining. But there is a bird that frequents the margins of this wise one's lakes, flies the same uplands, pastures on the same fields, that is wiser and warier than he. As the goose is wiser than the mallard, so this bird is wiser than the goose. There is no lesson that he has forgotten, and more than this there is no lesson to which he has not applied the talents of a most reflective intelligence. And if you ask his name, why, to be sure, he is the lanky tomcrane of the sandhills; the attenuated warrior who, as the Sioux said of Custer, knows not how to yield. A blade more willing, a spirit less servile, a wit of greater play, never saw the prairies spread beneath his winnowing wings.

God love him! That bald and valiant warrior head. That bold, free eye of blazing orange. That awkward neck above the awkward body on ungainly legs. The pride, the loyalty, the courage of him. In every inch of his four feet a character to command the most respectful consideration—to command and to enforce it. Well, then—

They say that the sandhill crane is all but gone from the depleted company of our North American birds, but that protection has halted the process of decimation and that the sandhill rallies to restore his numbers. And one could wish that this is true, as possibly it is; but I cannot think that hunters killed the sandhill crane. When his lands were taken from

him, and broken to the plow, it may have been with him as Elliott Coues predicted it would be with the whooping crane, when Coues had written: "So wild and wary a bird must be much influenced by the settlement of the country." For certainly, although hunters coveted both of these birds, and splendid cousins they are, they accounted for only an inconsiderable proportion of the vast flocks the continent once knew. Few, indeed, were those sportsmen who successfully matched wits with either.



THE LOOKOUT

And I write this in the Oregon country, where sandhill cranes once were numerous and the sky was filled with the wildness of their trilling; where Dr. John McLoughlin at old Fort Vancouver furnished his banquet board with the bird; and where men say, who call to mind an earlier time, that it beats them and they cannot account for it. But Coues, the master ornithologist, knew the temper of the flock . . . . much influenced by the settlement of the country. And they tell me, those who frequent the Dakota prairies where I have seen the sandhills in their thousands, flock after flock gleaning like sheep, and having much the same appearance at a distance, and flocks giving the flight call and flocks hovering to descend, that the sandhills visit those prairies now infrequently, and in small companies at most. If men do not harass them? Let us trust they may linger for many generations.

On a day in autumn, when the cutthroat trout were coming up from the sea, and the wind was wet, and the river silvered with rain, I heard again the memorable, trilling call of the sandhill crane, that seems so near at hand; that is, in truth, so far. And there is nothing like to it in all Nature, save the trumpets of the geese, and these, I think, are best. There was a leap in my heart and a catch in my throat as I swept the tumbled sky to have a glimpse of them. Two specks against the grayness, two only, faring southward. So I threw a wish after them—and they were gone. And these, though there are regions where they are yet moderately plentiful, were my count of crane in full ten years.

On the brown prairie of northeastern North Dakota I used to see them post their sentinels. It was curious to observe that if one came toward them with casual or friendly intent, and bearing no gun, the sentinels were undisturbed and cried no warning to their flock. Often they would permit a near approach, though watching warily for an overt gesture. Pass, friend! But if you bore a gun, or sought to gain a yard by stealth, they marked you across a long half-mile, and called shrilly to their comrades, and with uncouth strides rose to wing. Then the air was vibrant with their jeers, for the flock, too, would be trilling as the sentinels overhauled it, and I can but think they made mockery of him who thought to cozen a crane.

It is their habit to post sentinels, usually three birds, on a hill or such rising land as affords vantage when the flock settles to feed. Consider the responsibility that is accepted by these trusted companions! They must be prudent, vigilant and all-seeing, for the welfare of the flock is in their keeping, and the flock must feed without a care. And it often happens, owing to the nature of the vicinage, that the three sentinels are posted at some distance from the flock—but whether the distance is great or little it never happens that any creature, with intent to molest, conceals its presence, though it move never so discreetly, from the faithful three. Two heads are bent to glean in the stubble, but one head always is lifted, and if you watch the sentinels closely you must learn that with astonishing regularity they have their turns at feeding and at duty. Thus far and no farther! You have advanced a step beyond the invisible deadline that their caution sets. They shamble forward and, as wings are beating, sound the alarm. *C-r-r-e-e-w! C-r-r-e-e-w!* And the flock rises, with taunting trills, and they will not rest this side of Newman's pond.

It was the habit of the sandhill crane to visit with marked punctuality the shallow sloughs that were their nightly taverns. They rose at dawn and were off to the stubble, but shortly before midday they returned to water, remaining for possibly a quarter hour. At four of the afternoon they returned again to the slough, thereafter seeking the fields for supper and drifting in at sunset to pass the night at roost just beyond the rushes, and, I think, in water of no greater depth than a few inches. These watering ponds and taverns were favored above all others, though for what reason none could tell, if the crane were not molested. But if treachery was toward, or there were guns in the sedge at sunset, no birds would pass that way. The grassy margins of these sloughs were littered with the brown and plumbeous feathers they had cast in their preening, and mud was signed by their spraddled footprints into curious hieroglyphics.

We hid ourselves one autumnal afternoon, another and I, in the thick, matted sedges of such a pond, after having watched from a distance the four o'clock exodus of the crane people. When the last bird had dropped from sight below the rolling stubble, and the last trilling was silenced, we raced to the sedges, lest some wandering straggler might spy us, and burrowed far down in the brown stems, and drew them over us and interlaced them. Before us stretched the narrow shallow, its farther boundary a belt of tender green, of short, thick and very juvenile grass, melting into the arid browns of the prairie. Water formed at our haunches,

SAILING IN THE BLUE

TWO, FAR OVERHEAD

as the fibrous mass gave under us, and very presently we were drenched as the misfortunate rat of metaphor, but snug we lay, and still, and in our eagerness spoke only in low whispers. The marsh owl hunted over us, nor seemed to heed; and the breeze of widgeons in passage stirred the marsh grass not a yard distant; and there came three plump and personable geese, idly talking, who circled the pool and judged it not to their purpose. So an hour passed, and two of these, and there were red and golden frettings on the water, and sundry ducks dropped in to drowse. Yet presently, in our impatience and discomfort, we heard from far away the twilight music of the flock, and it came nearer, and yet nearer, until it seemed but over yonder. Then silence absolute—and we knew the crane had seen their lake. For so it is with them when they draw nigh to water; every throat is hushed, and they drift in like slaty shadows, circling low and lower.

There are eons in the space of but a moment or so, and we knew them all ere we heard a note I had never before heard any crane give throat to. It was comparable to the deep croaking of some mighty batrachian, and there it sounded, and nowhere—the voice of their leader as they reconnoitered. An utter silence again, broken only by the sharp splash of an alighting teal. And cautiously, ever so cautiously, we raised our heads to peer across the pond. This picture is mine to keep, and I have my dividends of it like any usurer. On the green baldric of young grass, that stretched between pool and prairie, and not a hundred feet away, were the crane—no longer awkward, dubious or alert, but stately, confident and quite at ease. Two-score or more of them, of an amazing height, strolling, standing and stretching on the threshold to their tavern, with the shadows deepening, and a last flare of sunset on the stubbled hills. I cannot hope to see them so again.

Nor can I ever hope to see them dance their dignified minuets in April, as I have heard they do, and as I have read. An aged Bohemian farmer, who came to the prairie country and settled on his homestead while yet there were many pronghorns and not a few buffalo, has told me that he and his wife—his young wife, kerchiefed and comely—often had watched the sandhill cranes at their dancing. And these dances, so he insisted over and over, for it was yet a marvel to him, were timed and measured as any quadrille, and were in all essentials the dances of the young folks when there was fiddling in a barn. Truly a marvel!

THE DANCE

Floyd Bralliar, in his book, "Knowing Birds Through Stories," gives at second-hand an account of the dancing of our own sandhill crane, as an observer took note of it on those same Dakota prairies of which I have written. You will observe that it agrees remarkably with the description afforded by the old homsteader. Mr. Bralliar's friend describes the dance of the sandhill crane in this manner:

"I was driving with a horse and buggy one afternoon when, as I rounded the point of a sand hill in full view of a small creek, I saw a flock of some nineteen or twenty sandhill cranes drawn up in a straight line on the prairie perhaps a half mile from the water. When I first saw them they were standing in a straight line as rigid as a company of soldiers standing at attention. I stopped my horses at once to watch them. Presently the bird at the head of the line walked out in front of the others and solemnly began dancing. He would hop first on one leg and then on the other, jump up and down, and whirl about, sometimes flapping his wings. This procedure continued from three to five minutes, when he solemnly marched back and took his place at the head of the line and the bird next to him walked out and went through the same performance. I sat there for more than an hour and watched until every bird in the line had taken his turn and performed his dance. When the last one had finished, the bird at the head of the line started the dance over again. After two or three had danced the second time, feeling that I could wait no longer, I drove away leaving them undisturbed. During all this time not one of the birds had uttered a sound."

Wary as the sandhill crane is in his wildness, no bird responds more readily to domestication. The javelin bill, and the crane's most insatiable curiosity, however, make him an

unintentionally dangerous pet when children are about. I once knew a merchant in a country town who kept several sandhill crane, reared from fledglings, and who was rewarded by veritable excesses of devotion. When he would leave for his office, the faithful sandhills would come loping stiffly after; and he would turn and drive them back, with shouting and waving of hands. But it sometimes chanced that, midway of the village street, he would meet with friend or stranger and pause to talk of this or that—for he was a merchant of many affairs. And the attention of the party of the second part would seem oddly diverted and wandering, and our merchant's more serious observations on the wheat crop would be met with hearty laughter. Very solemnly, very seriously, his sandhills would be stretching their long necks around the coattails of their friend and patron. Naught to do but fall upon them once more with shoutings and wavings, and send them striding back to the red barn across the tracks. He used to sigh and say they'd be the death of him yet—but they never were.

The courage of the sandhill crane is magnificent, his loyalty to the flock a shining attribute. Wounded—nay, dying—he will turn on his tremendous foe and give battle, stepping as briskly as a fencing master, thrusting savagely with the rapier of his bill. While if a comrade fall from the flock, to any gunner, the wrathful companions frequently will follow the slayer for an hour or more, circling over him at a safe distance, and trilling their imprecations. A very knightly fellow, this Sir Longshanks of the prairie, without fear and without reproach, and I should like beyond all other wishes—

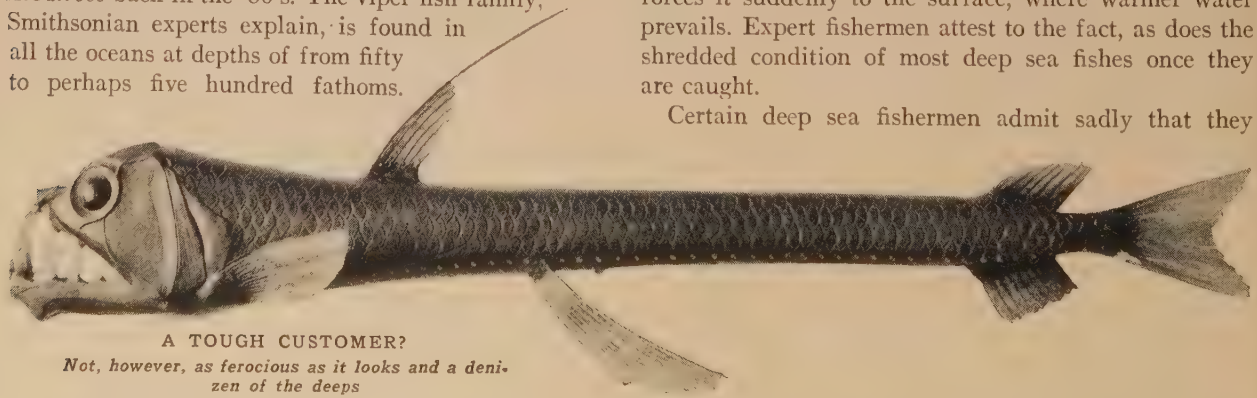
To lie at ease on the brown turf of the prairie, and hear the trilling of the flocks; or search the sky, perhaps, for some solitary crane, wheeling as any eagle, so lofty in his circling as to be but a pinpoint in the blue, yet with his call seeming to sound a stone's throw from my ear. And in this I should find contentment, after my fashion.

HERE is BEN HUR LAMPMAN, prose poet of the Northwest, whose delightful Nature stories are well-known to our readers of long-standing. Born of a pioneer family in Wisconsin and reared there and in North Dakota, Mr. Lampman elected the newspaper profession as a career. Since 1916 *he has been editorial writer on the Portland* Oregonian *"with a weakness for introducing natural history into the columns of that excellent newspaper." He is the author of one book of a variety of collected writings.*

The VIPER FISH

by James N. Miller

WHILE the viper fish, with its long fangs, and rows of phosphorescent spots along the lower part of its body, is comparatively numerous, as deep sea fishes go, nevertheless surprisingly little is known about its habits. This specimen was obtained by the *Albatross* back in the '80's. The viper fish family, Smithsonian experts explain, is found in all the oceans at depths of from fifty to perhaps five hundred fathoms.



A TOUGH CUSTOMER?
Not, however, as ferocious as it looks and a denizen of the deeps

Many are the reasons why science knows little about the life cycle of the viper fish and the rest of the mysterious inhabitants of the sea's vast labyrinths. Deep sea fishermen work under terrific handicaps in trying to get the far-flung sea dwellers to the surface alive and in good condition. We all have watched a glass of soda water fizz when it gets warm. Very much the same sort of thing happens to a deep sea fish, when, after spending perhaps a life-time in the icy depths below, man's net forces it suddenly to the surface, where warmer water prevails. Expert fishermen attest to the fact, as does the shredded condition of most deep sea fishes once they are caught.

Certain deep sea fishermen admit sadly that they never have seen a deep sea fish alive and in good condition. However, off Kamchatka, and in other regions where the water maintains a consistently cold temperature, the deep sea nets reap harvests of specimens in excellent shape.

SOIL TESTING *for* WILD FLOWER GARDENS

Edith Ludlow Marsh

ARE YOU the glad possessor of a flower garden with all its colorful changes, from the shadowy blues of early spring to the brilliant scarlets and purples of autumn? Or maybe your garden is only the tiniest corner of a back yard with a few loved treasures tucked in among some stones at an angle of the tall old fence. Be it great or small, is there not deep down in most of us an unaccountable yearning for another spot in which to make a home for some of the children of the deep woodland, sunny mountainside, or cool, moist glen in which place Nature unaided by man has so carefully reared them according to their requirements? And how many of us have adopted them only to see them droop unhappily in a few weeks or months. They do not like their new homes. What a disappointment, for we have so tenderly brought them from their wild haunts and so carefully given them "the very best place in the garden" with just the right light, drainage, soil texture and protection. Or, possibly, we found a nice woodsy spot for the moccasin flower and trailing-arbutus, and a suitable looking glen for the sensitive ferns.

But how do we know that we have placed them where the proper food is available if we do not know the food requirements of these wildings, or the properties of the soil where we have transplanted them? Would an intelligent mother put lime into the baby's bottle without an understanding of her child's requirements?

Upon the ability of every plant to adjust itself to its environment depends its very life and perfection, and upon this fact rests the supremely important science of ecology. And, so, many of our most beautiful and useful native flowers and shrubs, notably among the Heath Family, such as rhododendrons, kalmias and andromedas, require definite soil reactions, as regards acidity or alkalinity, to fulfill their requirements. Can we not, by means of a simple soil test taken at the roots of the plants when transplanted, match these requirements in our own gardens?

We are not addressing the ruthless vandals with their funeral processions of spring flowers from the countryside to the garbage cans, or the people who go out with a jimmy to pry and abduct from their homes among the craggy ledges the delicate rock ferns which cannot survive the injury of these safe-cracking methods.

THE MOCCASIN FLOWER

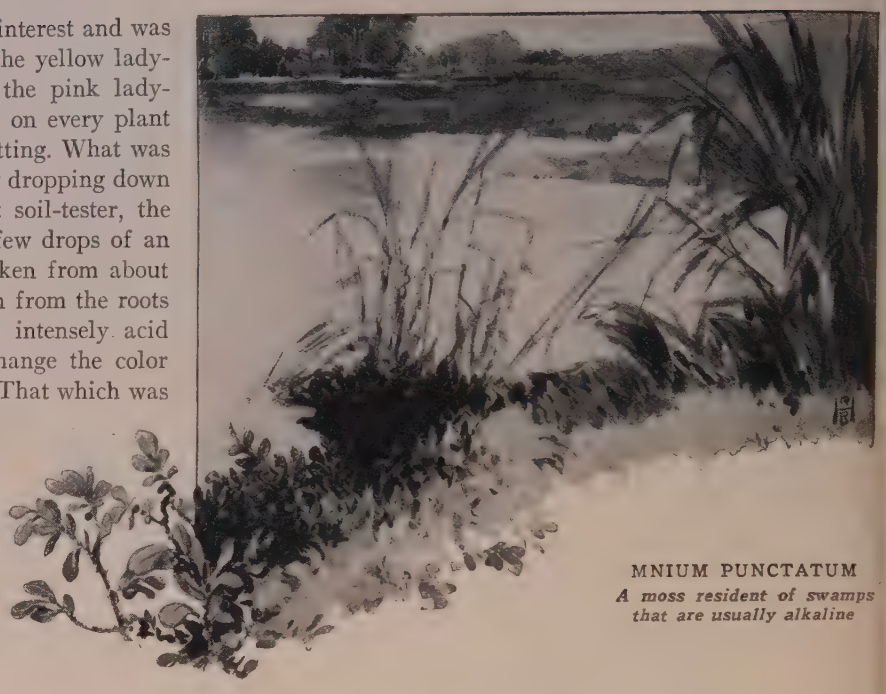
To adapt this to the soil of one's garden it is needful to know its likes and dislikes

Our sympathy is with the real Nature-lover whose conservation conscience is already awake to the necessity of more intelligent ways of bringing some of these wildings under cultivation that they may be preserved from our fast encroaching civilization. Whether this can be done successfully or not rests with each one of us to decide.

Let us consider, for illustration, some of our wild terrestrial orchids which depend on micro-organisms at their roots for making the food supply available. These orchids are necessarily supersensitive to transplanting and also to soil reaction, which fact makes them particularly difficult of culture.

Two years ago the writer visited a beautiful woodland glen where, beside a merrily dancing little brook, in among the fragrant hemlocks, the owner had attempted to naturalize groups of the pink lady-slipper, *Cypripedium acaule,* and the yellow lady-slipper *Cypripedium pubescens.* Truly, a delightfully conceived picture. "See how luxuriantly they have all bloomed this very first year," the happy owner remarked jubilantly. The next year I again visited the

hemlock glen with a great deal of interest and was shown one puny, dying stalk of the yellow lady-slipper, while its lovely cousin, the pink lady-slipper, had sent forth a blossom on every plant and the seed pods were already setting. What was the secret of this tragedy? Quickly dropping down on my knees with a little pocket soil-tester, the story was immediately told by a few drops of an indicator dye on a bit of earth taken from about the plant roots. That soil be taken from the roots is essential. The test showed an intensely acid soil indicated by its ability to change the color of my green dye to a brilliant red. That which was life to the pink orchid was death to the yellow. The first year's bloom had merely shown the ability of this plant to mature the blossoms from buds already set, but the tannic acid of the hemlock proved as deadly to it as did the hemlock of a different family which Socrates drank.



MNIUM PUNCTATUM
A moss resident of swamps that are usually alkaline

At times appearances are very deceptive. Last summer in one of the fascinating limestone regions of the New Jersey Highlands, where the rocky ledges were festooned with rare and graceful purple rock clematis, columbine in profusion, and many dainty little lime-loving rock ferns, I was much puzzled by the appearance of a lovely group of these same yellow lady-slippers blooming gloriously under some giant pines. I was told that they had never failed during six years to send forth their quota of flowers, although they were obviously living in the extreme acidity such as pine needles usually produce, but they had never seeded. Here was a mystery indeed, and again my faithful little soil tester solved it, showing a circum-neutral soil reaction. In this case the acidity of the pine needles had been neutralized by the strata of lime rock upon which the feet of the wildings rested, and the latter had been able to obtain their desired food. The pine trees had long ago adjusted themselves to conditions, as most forest trees are able to do.

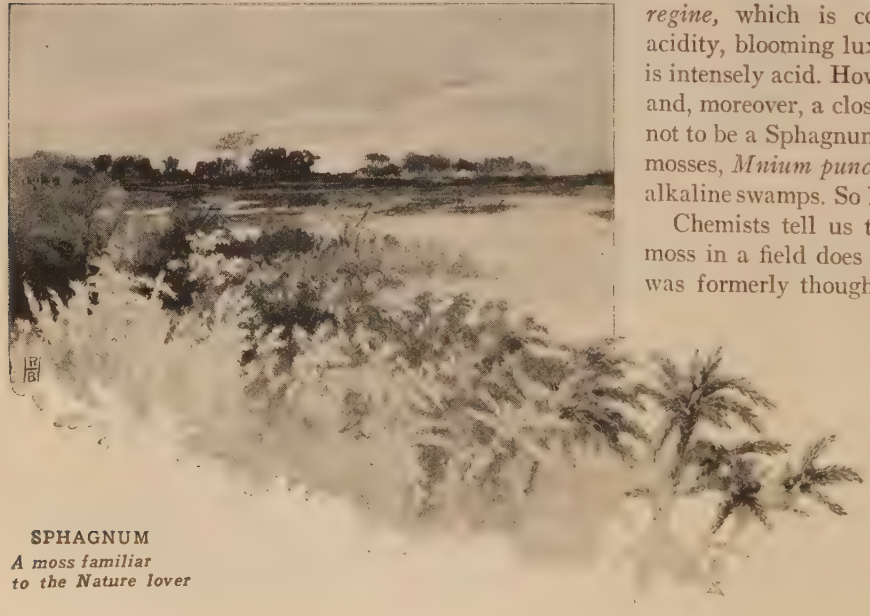
MRS. MARSH, *the author of this article, is conservation chairman of the Garden Club of Madison, N. J., where she first began her work with soil testing. Word of her abilities along this line rapidly spread and she has been called upon to do much educational work. She is a member of several botanical organizations and was requested to supervise the soil testing demonstration at the Garden Club booth at the International Flower Show in N. Y.*

After much inquiry, an old resident was found who remembered having seen these cypripediums being transplanted to their present home years before. I carefully scraped the pine needles well away from their feet in the rather vain hope of baby seedlings some day should the soil become more friendly.

At another time I was taken by a friend into a swamp, just a dismal morass to most people but a joy to the investigating Nature-lover, for the purpose of seeing the anomaly of the queen of orchids, *Cypripedium regine,* which is considered by scientists to dislike acidity, blooming luxuriantly in sphagnum moss, which is intensely acid. However, the test read slightly alkaline, and, moreover, a close examination of the moss proved it not to be a Sphagnum at all, but one of another group of mosses, *Mnium punctatum,* which I have often found in alkaline swamps. So let us not be deceived by appearances.

Chemists tell us that even the presence of sorrel or moss in a field does not necessarily prove its acidity as was formerly thought by the farmers, but may simply indicate a poor or depleted soil.

Dr. Edgar T. Wherry of the Bureau of Chemistry at Washington, by leading the way to a simple and intelligent method of testing the soil for chemical reaction and by preparing accurate soil preference lists, has vastly broadened our view of the great conservation movement, in



SPHAGNUM
A moss familiar to the Nature lover

showing how to avoid a large percentage of failure and waste of our native flora which occurs even with most experienced and conscientious gardeners.

To supply the acidity which many of our wild plants require, he suggests leaf applications of pine, hemlock, spruce, oak (white oak excepted), old sawdust and sphagnum moss, or, when none of the above are available, commercial tannic acid or even aluminum sulphate. To neutralize an acid soil, lime is very effective.

There are on the market some simple and inexpensive sets for testing, and still others for more specialized work. These add greatly to the convenience of making the tests, the indicator dye being the essential factor.

With the growing interest in wild flower gardens and the resultant need of soil testing described in this article, there has naturally been created a demand for soil testing outfits. We list the following as a matter of service to our members:

B. D. H. Soil Testing Outfit, *an English product obtainable through the Garden Club of America, 598 Madison Avenue, New York City. Price $3.50 plus postage.*

"Wild Flower" Soil Testing Set, *obtainable from the Wild Flower Preservation Society. Price $2.25 postpaid.*

La Motte Duplex Soil Tester, Kenny Soil Indicator Field Set *and* Morgan Soil Testing Set, *obtainable from La Motte Chemical Products Co., Baltimore, Md. Prices $1.50, $5 and $10 respectively.*

Soiltex Testing Outfit, *obtainable from Swift and Company, Chicago, Ill. Price $1.00.*

We believe that in the near future soil testing will be taken for granted, merely as good garden practice, by all gardeners, not only by specialists.

So whether we yield to our longing to possess a little sanctuary for the wild things depends largely upon our good faith in making the effort to use every intelligent means to conserve them, by giving them proper food.

Do Not Kill Harmless Snakes!

by Doris M. Cochran

Do many people realize what it means to kill a harmless snake? And how many know the actual loss in *money* value which the nation suffers when misguided and thoughtless persons indulge their love of killing by disguising it as a falsely superstitious "hatred" of snakes?

In the rich farm-lands of the western United States, the millions of gophers, field-mice and rats would shortly increase to billions which would swarm over every bit of edible material and would carry germs of disease wherever they went, were it not for their strong natural enemies, which keep their numbers somewhat in check. Wolves and foxes, hawks and owls are becoming fewer day by day, as they fall easy victims to hasty persons who believe in exterminating every creature which may sometimes vary its diet of wild food by stealing chickens or ducks from the barnyard. The most effective natural enemy of the rodent tribe is the snake, especially the "bull-snake," which can make its way into a narrow hole and trap the inmates in their subterranean homes, while the hawk and the fox have to wait patiently and often fruitlessly for the rare appearance of a rodent above ground.

Hoag and Ford

THIS FARMER KNOWS

He is glad to have this sign on his property

In Los Angeles County, California, the citizens are now aware of the great value of the numerous harmless snakes. When the collectors from museums, universities or zoological societies come to make collections representing the fauna of the region, the farmers ask them to take away not more than one snake from each farm and to leave the rest of the snakes there to keep down the numbers of rodents and thus to save the grain they produced.

"HE SOON HAD THE RUN OF THE HOUSE"
(Below) "When we tried to carve his image in wood for a pair of book-ends . . . he posed beautifully"

"SQUEAK"

An Orphan Robin Becomes Artist's Model

by Hugh Spencer

HE WAS an orphan, there was no doubt about that; all morning long he had cried piteously in the privet hedge and no mother robin answered his calls. Sinister cats, lurking in the tall grass nearby, licked their chops as they listened to his cries. Mother robin had probably furnished them with breakfast; the baby would make a good appetizer for lunch. But we decided right there to foil that little scheme. We would be father and mother to the little orphan.

It was forcible feeding the first few days and it took two of us to do it. Once an hour one of us had to pry open his bill while the other dropped pellets made of hard-boiled egg, milk and crumbs, down his throat. In the same way we gave him water to drink. But Squeak was an apt pupil and not only learned to open his mouth but also to help himself from our fingers, lips, back of our ears or any other place that we put tidbits for him to eat.

While he was still in his helpless infant stage some friends asked us to go for a long motor trip. None of our relatives would take Squeak for a boarder while we were away, so we accepted the invitation with the condition that Squeak be included in the party. He seemed quite contented in a small cage covered with a cloth and furnished no small amount of amusement, when once an hour we had to stop the car and take him out to administer his rations.

His wings grew strong and he soon had the run of the house. Upstairs and downstairs he would swiftly fly, and his favorite landing place, if it were conveniently near, was the top of mother's bobbed head. With a sharp squeak he would hop to her shoulder, then to her hand, and, "a strawberry, please", he would squeak.

Squeak learned to recognize his

THE AUTHOR of this article is an artist, as well, living in Chester, Connecticut. He is actively interested in Nature and Nature art, being well known for his humanistic and whimsical drawings. The name that Mr. and Mrs. Spencer have selected for their home is typical of their interests. It is called "Briarpatch".

"HE SEEMED TO HAVE ABSOLUTELY NO SENSE OF FEAR"
"Visitors were sometimes startled by a flash of wings followed by the impact of a small body"

name and would respond instantly when called. He was always on hand at the breakfast table and would alight on the edge of a cereal dish and help himself as daintily as if his ancestors had done the same thing for generations.

Squeak never allowed the day to go by without his bath. Any convenient pan of water would do. With a squeak he was in, splashing and chirping with as much enjoyment as a boy in a swimming hole. Then a swift flight to a convenient perch to preen and dry himself. He was a terror to the flies on the window panes and not many escaped his sharp beak.

He seemed to have absolutely no sense of fear. Visitors were sometimes startled by a flash of wings followed by the impact of a small body on the top of their heads and sharp cries of delight. Sometimes we allowed Squeak out of doors but never alone for fear that in his innocence and trusting confidence he would fall prey to some marauding cat, hawk or malicious human.

He seemed to enjoy posing for his picture, and would cock his head to one side and watch the progress of the pencil as if to say "It looks easy, I wonder if I could do it". When we tried to carve his image in wood for a pair of book-ends he was equally accommodating and posed beautifully but the skill of the artist was not equal to translating Squeak's charm and beauty into so intractable a material, and the book-ends remain unfinished.

Autumn came and still we had Squeak with us apparently happy and contented. Then one sad night he chose to perch on the top of a half open door. Someone slammed the door,—a thud and a cry of pain followed. There was crape on our door next day, and tears in our eyes when we laid little Squeak away in his last resting place.

"HE SEEMED TO ENJOY POSING FOR HIS PICTURE"
"He would cock his head to one side and watch the progress of the pencil as if to say, 'It looks easy, I wonder if I could do it'"

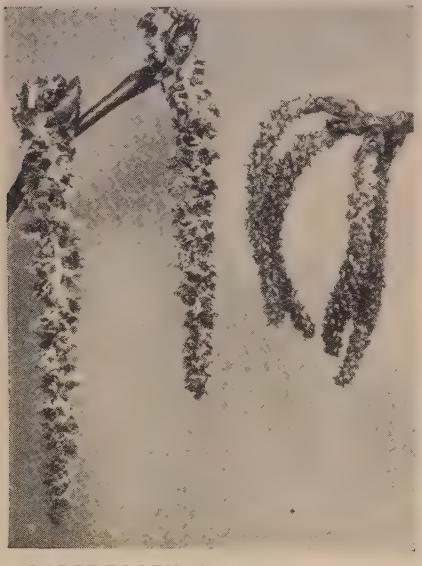
TREE FLOWERS—

How to Know the Hard Wood Trees by Their Flowers

by Mary F. Robinson

Photographs by Charles W. Robinson

CATKINS OF BUTTERNUT
These flowers are among the largest and least graceful of all



LARGE TOOTHED ASPEN FLOWERS
The catkin at the left bears the pollen; the one at right produces the seed

MANY TREES have small flowers, early blooming and ephemeral, with tints and shades that blend so closely with colors of stems and tiny leaves of opening buds that they sway in the warmer spring winds unseen except by those who keep close watch on the wonders of Nature.

All trees when mature bear flowers primarily for the purpose of producing seed. To accomplish this end, there are two essential organs, the pistil and the stamen. The pistil includes the seed case, and the stamen bears the pollen, a fine dust, commonly yellow. In contact with the stigmatic surface of the pistil this fertilizes the flower, or, in the gardener's language, sets the seed. These two parts, the essentials of a perfect flower, we usually find in each blossom in the garden, but trees, especially those in the woods, more often have a separate flower for each, a pollen-bearing flower and a seed-producing one. The pollen-bearer is called staminate and the seed-producer is the pistillate. The two kinds may or may not be on one tree.

Charles Darwin began a long series of experiments in 1861 which proved conclusively a fact stated as long ago as 1799 by another famous botanist, that a better, healthier plant comes from seed produced when pollen is brought from another flower. Two of Nature's pollen carriers are insects and wind, but in the forest wind does by far the greater amount of the work. The tree flowers having only stamens shed their pollen, wither, and fall, but from the seed-producing flowers grow the fruits,—keys of the maples, samaras of the elms, paddles of the ashes, acorns of the oaks, the cone-like winged seed bearers of the birches, and the nuts of the hickories.

In order not to miss the flowering time for woodland trees, it is well to make a simple calendar to carry on your hikes. Weather conditions will shift the dates earlier or later by a week or two, for a tree will open its flower buds at a time determined only by the action of warmth and moisture upon it, but after the blooming time begins the different trees

(Left)
FLOWERS OF YELLOW BIRCH
The pollen-bearing catkins are pendant, the seed catkins of this tree are erect

(Right)
CATKINS OF THE HICKORY
They are pollen-bearing and hang in groups of three under the new leaves

THEIR STORY

Many readers will recall two companion articles to this one by Mrs. Robinson. They dealt with Tree Buds and Tree Leaves in the same way that this story of Tree Flowers is presented. Before her marriage, Mrs. Robinson taught sixteen years in the schools of Cambridge, Mass., and is still active in Nature study work.

blossom about in the same order each year. The willows are the earliest to bloom. Sometimes we find the soft, silvery-gray catkins or "pussies" in March before the snow is gone. White and slippery elm, large-toothed aspen, and silver maple trees also open their flower buds in March. Red maples, box elder, Lombardy poplar, and balsam bloom early in April, followed a little later by the cottonwood, quaking asp, balm of gilead, white poplar, Norway maple, most of the birches, the hornbeam, and the blue ash. Late in April come sugar and sycamore maple blossoms, red oak, and green ash. Most of the nut trees blossom in May, first black oaks, later the white oaks; beech blossoms come early in the month, hickory and butternut near the middle of May. Red and white ash, striped maple, and tulip trees bloom the latter part of May. The gray birch is the only one of its family to wait until May, when we find the beautiful long catkins after the leaves have reached their full size.

Woodland tree flowers may be stemless, individual florets with either or both of the essential parts, or clusters of individual florets on threadlike stems as sensitive to every breath of the wind as a delicate fringe, or the tassel-like catkin with tiny florets under protecting scales in vertical tiers along a slender axis. When the trees shake out their delicate fringes and sturdy tassels while the baby leaves are still protected within the smaller buds, it is usually because the tree is more dependent on the wind to carry its pollen than upon insects.

High up in the slender, gracefully curving American elm branches, the big flower buds that were so plainly visible against the blue winter sky burst open in the warm days of March, freeing the closely-packed flower clusters within. These drooping clusters comprise individual florets, usually perfect, each flower on its own stem. Below the hairy-edged, reddish lobes of the calyx, which is often flattened and in side view appears fan-shaped, show dark purple red anthers, and projecting still farther below are the two stigmas of the pistil. About the same time fat, tan and woolly buds of the slippery elm begin to release their little flowers in profusion.

SUGAR MAPLE FRINGES

The tree may be identified by these delicate, hairy, yellow-green flowers

FLOWERS OF BOX ELDER

The pollen-bearing flowers make the staminate tree conspicuous when in bloom

(Left)
PISTILLATE BUTTERNUT FLOWERS

They are showy blossoms and notable because of their bright red stigmas

(Right)
CATKINS OF WHITE OAK

They are short and the florets arranged irregularly along the threadlike axis

These florets have green, bell-shaped, very hairy, scalloped-edged calyxes, and their reddish brown anthers are suspended on pink filaments. The perfect flowers seem more common than either the pistillate or staminate.

Deep in the woods the large-toothed aspen may be blooming at about the same time as the white elm which likes the open country better. The aspen flowers are all catkins, pistillate on one tree and staminate on another, dependent upon the wind to bear the pollen from the staminate tree to the pistillate for the purpose of setting the seed. The staminate catkins are about four inches long. In these each little floret consists of a sharply pointed, hairy scale attached to the

catkin axis beneath which from a shelf-like disk concave on the upper surface grow the many stamens with red anthers. The whole catkin when fresh and just lengthened is red in appearance. The pistillate catkin when developed appears green at a little distance, but nearer to, it is closely covered with bright red threadlike stigmas. These catkins are neither as large round nor as long as the staminate. No matter what kind of poplar you find on your hike it will bear but one kind of catkin, either pistillate or staminate. All common willows and poplars bear staminate and pistillate flowers both in drooping catkin form.

In autumn the red maple was arrayed in gorgeous sunset red, in winter it showed us bright red new

SWEET BIRCH CATKINS

They are beautiful but soon fall. The upright catkins contain the seeds in autumn

(Left)
FROM A SCARLET OAK TWIG

The twig bears drooping staminate catkins and acorns one year old

(Right)
WHITE ELM BLOSSOMS EARLY

Flower and seed clusters come out before the tree fully leaves out

(Below)
FLOWERS OF THE RED OAK

Drooping staminate flowers and tiny pistillate blossoms in the leaf axils

twigs and buds, and now again in the spring, true to its name, it adorns itself with red blossoms. Though its flowers are small, they come in profusion and the redness enhanced by the background of light gray branches shows along the river banks even as we pass in the car, or from the hills as we look down into the swamps. In the woods the trees are usually distinctly staminate or pistillate, but among cultivated varieties there may be both kinds of flowers on one tree or even perfect flowers. The pistillate tree is not so showy, for the flowers are less numerous and the stigmas, though crimson, do not radiate so much color as do the stamens en masse.

Sometimes there are five stami-

nate florets within a bud, each with a very short yellow stem, five yellow sepals, five petals tinted with red and five stamens, the red anthers of which are attached to tiny yellow filaments. The stems of the staminate florets do not lengthen or droop. The pistillate florets at first are nestled within the bud scales, with red sepals, red petals, and a tiny green-winged seed case with two red stigmas joined at the base. Afterwards the red pistillate floret stems lengthen considerably. Silver maple flowers resemble those of the red maple in size and arrangement, but the former have green, bell-shaped, scalloped-edged calyxes which remain within the bud scales, and no corolla.

Usually late in April, each Norway maple presents a beautiful

sight when the satiny, gorgeously tinted, long inner bud scales of all terminal buds curl back against the brighter red-tipped outer bud scales forming vases to hold groups of delicate baby leaves and countless flat-topped clusters of fresh, sweet, mustard-yellow blossoms on slender yellow stems. A sycamore maple ornamented with its symmetrically tapering, gracefully drooping green flower clusters which come from each terminal bud is beautiful and conspicuous.

Some, but not all, sugar maples blossom with Norway maples, for trees of one species bloom in succession, that the pollen carriers may not be overworked and that the pollen may not be wasted. The long-stemmed clusters of a delicate shade of greenish yellow wave like scattered fringes more often from

RED MAPLE FLOWERS
The staminate shed their pollen, wither and fall

(Below, left) WHITE ASH
The young staminate flowers are prominent purple masses

ing catkins, hidden all winter, are put forth with the leaves to sit erect upon the stem. The yellow birch has staminate catkins about three inches long, golden yellow from a distance. In each there are alternating rows of stiff, three-lobed, yellow-green scales banded with reddish purple and fringed with hairs, beneath which appear tiny green calyxes and anthers tinted with reddish purple. The upright pistillate catkin is about one inch long. The sweet birch staminate catkins are not quite so broad, the scales are tipped with reddish brown, the anthers are yellow, making the dominating color a greenish yellow. The pistillate catkins are shorter than those of the yellow birch; their tiny scales are pointed, wholly green, and less hairy. The threadlike pink styles are so numerous they almost hide

(Above, right) WHITE ASH
These pistillate flowers form clusters of ash paddles

PISTILLATE RED MAPLE
When fertilized they produce the winged fruit called keys

the topmost branches. There may be perfect and staminate flowers in the clusters. In the perfect flower the calyx is smaller, the anthers do not extend beyond the calyx, and the stems are not so long as those of the staminate flowers. In both kinds a yellow-green, five-lobed, bell-shaped calyx about three-eighths of an inch deep closely protects the stamens. The anthers are yellow, the filaments white; the style has two stygmatic surfaces very delicately tinted with pink.

Birches have a drooping staminate catkin but, unlike the poplars, a stiff, nearly upright pistillate one. In April most of them shake out compact, sealed pollen-bearing catkins which may be seen all through the winter months, and let them hang loosely to dance in the sunlight and frolic in the wind, their pollen carrier. But the seed-produc-

the scales from our casual view.

The blue ash is the first of the ashes to blossom, but unlike all the others it has perfect flowers. Staminate flowers of the more common white ash in their early stages are compact spherical masses of dark purple, which, on the stout twigs, are very conspicuous against the sky. The purple color is in the long grooved anthers packed closely together in the rounded head. If we separate them we find that two or three anthers are on filaments which grow from a tiny green calyx on a short green stem. The calyx is so small that even with a magnifying glass the toothed edge does not show. These purple balls of flowers from the lateral buds elongate somewhat so that the green branching stems become visible and the anthers turn yellow when the pollen is ready to be carried by the wind to

the pistillate flowers on another white ash. From a distance the pistillate flowers resemble a rather stiff drooping cluster of branching slender stems. Near to, we see that as the main stem in the cluster lengthens, it carries down with it some of the bud scales. Side stems come out at these scales bearing tiny blossoms, each consisting of a green, bell-shaped calyx with pointed margin and a long reddish style divided into two parts near the end. The red and green ash bear on separate trees staminate and pistillate blossoms similar in appearance to those of the white ash.

Nut trees, such as oaks, beeches, hickories, and butternuts, bear, both on the same tree, pendent staminate flowers and small inconspicuous nut-producing flowers, difficult to study even with the magnifying glass, single or in groups of two or three, in the axils of the new leaves. Of these staminate flowers the beech with its ball-like clusters on slender long threads is the only common nut tree whose pollen-bearing flowers are not in catkin form. The oak staminate catkin is the most slender and the very small florets are placed spirally, leaving the threadlike stem visible; hickory catkins hang in threes from a common stem; the butternut catkin is the stiffest, least graceful, and largest of all. The wind is the pollen carrier for the nut trees.

The red oak and the scarlet are the first to hang out their bunches of drooping flower-lined threads to dangle near the ends of the twigs. I have counted twenty-two scarlet oak staminate catkins in one bunch, some four inches long. The catkins of the oaks belonging in the black oak group are similar, varying a little in color, in the number of calyx lobes, and in the number of stamens, with florets spaced in a fairly regular manner along the hairy catkin axis. The bear oak of the higher altitudes has a shorter catkin than the others of the group, but it has the most brilliant coloring. The dominant color may be a scarlet or a bright orange yellow. The white oak catkin does not hang straight like those of the black oak group, for the little florets are irregularly spaced and the grouping together in bunches along the catkin axis gives the thread a knotted appearance.

The hickory tree in May holds to the sun at the tip of each twig an opened bud, iris-like in scale arrangement, gauzy, satiny, and exquisitely tinted with red on its downy green. Between the turned back outer scales and the almost upright baby leaves folded together like long, tapering, green fingers drop down the immature, pollen-bearing, green catkins, three side by side on a common stem. Sometimes there are nine triplets or twenty seven individual catkins in a shagbark hickory bud. They lengthen considerably as they develop. The catkin scales are distinctive, each having a very long, pointed middle division; the anthers shine out underneath the scales a bright orange red. The triplet arrangement of catkins distinguishes the hickory catkin from all others.

Patient observations from year to year will reveal the elaborate preparations our tree friends make for the reproduction of their kind. We marvel at the minute and varied flower forms but more especially do we marvel at the mysterious instinct or intelligence, or whatever it may be, that leads the trees not only to form and arrange their flowers so that wind or insect may aid in the desired cross pollination, but to force or to hold back the flowering time of tree families and even members of a species so that all may have equal chances in the setting of their seeds. Thus is Nature marvelous.

And THEN Came MAN

Nature Made a Thing of Beauty; Man Unmade It

MEN are putting years of work into fashioning a beautiful memorial on the face of Stone Mountain. Nature worked for centuries to carve the wonderful Old Man of the Mountain in New Hampshire. Man took fifty gallons of traffic paint and twenty gallons of linseed oil, climbed this beautiful mountain to the smooth outcropping of rock and painted what the picture shows. He swabbed paint on letters sixty feet high and regarded his handiwork with pride. It was good advertising. The next year he went back with more paint and more oil and painted an arrow one hundred and six feet long, with a shaft four feet wide, to point to the hostlery which this atrocity of the hillside advertises.

Driving from Winterdale, Pennsylvania, to Port Jervis, New York, Miss Josephine L. Baldwin first saw this blaring blot on the landscape several miles away and later took the accompanying picture. Heartily endorsing the American Nature Association's Roadside Beautification and Outdoor Good Manners campaign, she sent the picture to us. Here it is. It speaks for itself,—in fact, it shouts.

WHEN we were discussing the proposed series of stories on the Smithsonian-Chrysler Expedition to Africa in behalf of the National Zoo, Mr. Haweis humorously mentioned the experience embodied in the present article, the fifth in the series. There were so many smiles in his story that we asked him to write it just as he told it. Here it is, a bit aside, perhaps, from the serious work of the Expedition, but all in the day's—or the night's—work.

With SHOT and SHELL

Zoo Collectors Fall Victims of the Urge to Hunt

by Stephen Haweis

MOST great hunters, in the latter end of their lives, cease to take delight in killing things. I once knew an old man who loved to wander in the woods with a gun under his arm which he would point, every now and then, at a squirrel or bird, and when the trigger clicked he would say whimsically, "It's lucky for him that the gun wasn't loaded, isn't it?" In all the years I knew him I never saw him fire a shell; it amused him to cover his quarry and the click of the trigger made no pain or sorrow for anybody. But before this stage is reached a sportsman generally manages to kill a great many animals and often comes to choose one particular kind of animal to which he devotes his attention. One friend of mine always went to Somaliland to shoot lions which he shot single-handed because, he said, it was poor sportsmanship to go out with an army to kill one cat and it was only fair to give the lion a sporting chance of killing his enemy.

> *'ercules was a mighty 'unter*
> *'e 'unted a 'are outer 'is 'ole;*
> *'e 'it it on the 'ead with a 'eavy 'ammer,*
> *And it 'owled 'orrible!*

Another man used to shoot lions with a revolver, aided by a pack of large dogs. It is said that he killed as many as twenty lions in a single day, for the lion, distracted by a pack of dogs was easy to approach and safe also. A poor sort of sport which the Government stepped upon very promptly. Another man dreams of shooting a snow leopard, because it is rare and beautiful and difficult to do. A New York sportsman who joined our party for a while had come to Africa for the sole purpose of shooting a buffalo, and so it goes. We want to shoot things and the spirit of slaughter bids men to go forth for all sorts of reasons, because, . . . because the day is fine, if no better excuse proves forthcoming.

We did not want to kill anything but to attempt to catch them alive, yet we also fell victim to the spirit of slaughter. Like great hunters we selected one particular prey in preference to others. We chose cockroaches, because they are natural enemies to mankind and extremely hard to shoot. The average American cockroach is of small stature and of no reputation as a game animal, but tropical varieties almost come within the category of dangerous beasts. Some are fully as large as a mouse. They infested one of the outhouses belonging to the stately edifice we hired as a permanent camp.

Blatta orientalis is the polite scientific name of a common cockroach. It is a sagacious brute, for why,—it has had generations of experience in every wile. It comes of ancient lineage, more ancient than that of any king upon the earth, for its family was flourishing before men, whether king or commoner, were born or thought of. But cockroaches are little respected in the world for all that; you must have something besides antiquity of family before it begins to matter whether or in what family tree your forebears climbed!

And wise? There was nothing those creatures did not know about self-preservation. They covered the walls when the place was dark, but an electric torch sped them swiftly into every crack and cranny where they sat with their antennae peeping out, detecting with Nature's wireless apparatus the quality and quantity of the hostility which was being directed against them. But sometimes they would misjudge the safety of their hiding places or would fly,—yes, they fly too,—and alighting on a new wall, would hesitate for a few mo-

ments. Then the hunter, with a twenty-two calibre rifle would fire,—miss by a quarter of an inch and chip a piece of cement out of the wall, followed by a chorus of cockroach guffaws from the box seats under the eaves.

"I'm a better shot with a revolver," said one sportsman.

"Go get a .45, that carries a ball nearly as big as a cockroach and—if you hit it, it will surely die."

"Sometimes I feel doubtful even about that. They seem to bear a charmed life. But I did not mean the big service revolver, I meant a target pistol which carries a .22—and I have some shells thoroughly loaded with dust shot. . ."

HE FETCHED HIS PET PISTOL

And a horrid contract to slaughter innocent insects was entered into

"Those are no good for anything, anyhow; they are so light that they spread too quickly."

"You would have to get close . . ."

"Stalk the brutes disguised as a basket of groceries?"

"One could get closer than we do."

"And hold the gun to the cockroach's ear, and blow out its brains? I see,—good idea!"

The irony was wasted on him for he had already gone to fetch the pet pistol.

"See here," he said on his return, "we'll take alternate shots and I bet you that I will kill more than you in twelve rounds."

Those were the terms of the disgraceful compact involving destruction of innocent, or at least not consciously guilty creatures. The plan was to fire and retire until the game emerged again from their ambush.

"You fire first."

"No, pray allow me, you fire."

At last I fired.

BANG!

One cockroach fell off the wall mortally wounded and another limped to safety holding up one leg.

"One," I said with some pride, "do we count the wounded?"

"We count only the dead," said my friend grimly. "Now it's my turn."

I went back to the house for a cigarette, but my friend hid in or behind a sack of potatoes in the darkness for ten minutes. I don't know that that was fair, because he could hear the game trampling to and fro and knew where the largest herds were situated before he pressed the torch button. Truth to tell I had almost forgotten the contest when I heard my rival shoot.

BANG!

"Come out here," he shouted shamelessly.

He was counting the dead, . . . "three, four, five . . . and I wounded a lot . . ."

"They don't count, you said so yourself."

"Six . . ."

"You have to show all the bodies."

"Seven!"

"It's impossible . . . there is almost no damage on the cement, . . . how did you do it?"

"I didn't spring the torch and I fired along the wall in the dark, and I got seven . . ."

"Seven at a blow, . . . the brave little tailor!" said I, feeling that I had been somehow cheated.

"If you give up, you owe me a cigar!"

"Oh all right," I said, "you win."

But I still think it was a low trick to play, both upon me and the poor defenceless cockroaches. I can't bear cruelty.

In the leading article in the May issue of Nature Magazine Dr. David Starr Jordan will take his readers on a ramble one May day beside a little brook, and there introduce them to the fishy inhabitants of the stream. This is Dr. Jordan's first appearance in our pages and his article is a notable one, both for its literary charm and for the facts it contains. It will be illustrated in part by a four-color frontispiece by R. Bruce Horsfall, who also has made some fascinating black and white studies for the article.

A MALE ROLLER
In this case the photographer is watching the birdie

Caring for Your Canary Pets

Some Good Advice and Some Information on Species

A FINE BIRD
Its pugnacious pose is a key to its sex, male, of course

by Henry J. Hamm

Secretary, American Association of Canary Breeders

CANARIES are, probably, the most universal of home pets. Their cheery, friendly songs are heard in myriad homes. Millions are raised every year to become loved members of many families. If given the proper care they live happily for many years, gladdening many a dull day and blue moment.

Much depends upon this question of proper care, the details of which breeders have developed. Unfortunately many young canaries that have passed into the hands of individual owners fail to survive the first moult. Often, then, the owner decides not to get another bird because he feels that it is cruel to house the little pet in a cage. Death, he concludes, came from confinement, but nothing could be further from the truth,—the fault is improper care.

As a matter of fact, if the canary as we know it were turned loose to make its way in the outdoors it would almost certainly be sent to its end. It lacks the instinct to search for food. It does not know the natural enemies of birds or the simplest rudiments of the wild world struggle for the survival of the fittest. Its ancestry is all against life in the open, and canaries freed by chance usually fly into some house to be cared for. The canary is the happiest in a roomy cage, in a pleasant room and with a fare and care that will keep it in trim.

It is not lack of attention that causes the greatest loss among canaries. Instead it is more likely to be too much care that complicates matters. Food, of course, is a most important factor. First it must be remembered that the canary is a hard-billed bird, so that its staple food must be seeds. The selection of the seeds, therefore, demands special attention, because upon their quality depends the continued song and health of your pet. Rape seed is the most important seed in the diet of the canary. These are the small reddish or black seeds that are in every mixture, being of two different kinds,—sweet German or summer rape, and large English or winter rape, the latter usually called Rubsen rape. Since rape resembles mustard seed, unscrupulous dealers have been known to use this seed instead of the more expensive rape.

A COLLECTION OF ROLLERS
Typical cages used by breeders piled up for judging the birds

Canary seed comes next in importance in the diet. This is yellowish or amber and the shape of wheat, to which it can be likened in many ways. If old and flinty it defies the bird's digestion and should have a glossy husk that will crack easily. Sicily canary seed is considered the best grade, while the addition of a small amount of maw or blue poppy seed balances these seeds nicely and serves as a regulator. Should you wish to give your bird a treat, mix one part thistle, one part black and white lettuce seed and one part flax seed. A teaspoonful twice a week is enough. Millet seed should never be used because it is starchy and fattening, and the bird that is obese in body loses his song from sheer laziness.

The saying about apples and few doctor's bills applies to canaries, as well as humans, and a small piece of sweet apple once a week is a good addition to the diet. Plaintain seeds taken when the rat tails are in the purple make helpful tid-bits, and most all green food in moderation is good. Cake, sugar and pastries should be banned as indigestion breeders. Canaries do not eat worms, but during the breeding season

some relish the grubs of the Mediterranean moth available at any flour mill.

Cleanliness is of utmost importance and you must watch the bird's cage for mites. These parasites are similar to bed-bugs in habits, attacking the birds at night and sneaking cravenly back into the crevices of the cage with the daylight. They sap the strength of the bird, who becomes weak and lifeless. Dip the cage occasionally in kerosene oil to which has been added a small amount of pine tar. This will discourage the little pests. Hang the cage in a cheery place, not in the sun or in the kitchen. Avoid all draughts, and, while it is surprising the extremes of weather the canary can stand, a quick change may prove fatal or may result in unseasonable moult.

CAGES RACKED IN THE BREEDING ROOM

The nest is on the door, enabling the breeder to inspect the cages with little disturbance to the birds

Just for emphasis, another word about seed. Unless you can be reasonably sure that the box seed you purchase is of new pack, have your seed merchant mix it for you. Three parts rape to one part canary, and a quarter pound of maw to each four pounds of the two is a good proportion for feeding.

Not infrequently a canary will break a leg. This does not mean that it cannot be mended and your local bird dealer should be consulted. We know of one dealer who sets many broken legs in the course of a year.

A PRIZE-WINNING LITTLE SONGSTER

A great deal of time and patience is required to produce a strain that will bring home such trophies

Fresh water is a necessity for your bird, and water for bathing should be made available daily during the warm months and twice a week during the winter. If the bird refuses to bathe do not force it. Always keep a supply of good gravel or grit in the cage to serve in place of teeth. Cuttle bone should be placed in the cage for the sharpening of the beak and the salt and other minerals it contains. A purgative given weekly will do no harm. Several drops of castor oil given in the beak with a dropper, or epsom salts enough to cover a dime in the drinking water, is a good weekly practice.

There are many species of the domesticated canary, but song provides the basis of classification. There are two classes, the roller and the chopper, the latter often being called the Hartz Mountain bird. Rollers are subclassified as hollow roll and Glucke birds, according to the tours or rolls in which they excel. Various names are applied to these, usually the name of the breeder who has bred the birds into a particular strain. It is the roller birds that are used in singing contests and they are bred to and judged by a particular standard of song. A good judge of rollers can call a tour as soon as a bird sings, naming it as bass, hollow roll, bell roll, water roll, schokle, flutes, Glucke and so on.

Preparing to show canaries the breeder selects pure-bred male birds, bringing the most desirable rolls and tours in the most perfect manner, and hens of equally good breeding. When the young males have completed the first or baby moult, they are each placed in a small cage called a training cage. These are racked so that the birds cannot see one another and a tutor bird, usually the father,—if he is a faultless songster,—sings for them. Daily for short periods the young birds are opened up and allowed to sing or try to sing what they have heard. This training continues for months until the youngsters have become as good, if not better, than their teacher. In the meantime the breeder has culled out birds that show a faulty tendency or high-pitched, nasal notes, for it is useless to enter these.

The birds are sent to the shows in show cases housing four birds and before they come before the judge are kept on a diet. When they are to be judged, the cages are placed four high, the judge considering all four at once. The American Association of Canary Breeders sets a standard of one hundred points, but a bird that scores fifty is rare. Such a bird usually commands a high price, and one hundred dollars is not a rare price for a prize-winner. These birds are usually purchased by other breeders for their strain quality.

The choppers, the other main classification, include birds whose song is more like that of our wild birds. Many breeders have softened their notes so that these birds are much desired for house pets, but no standard of song has yet been devised for this type of bird. They are judged purely for type and feather. The color of the canary, however, does not designate the kind or type. They are raised in different colors and markings. We have clear yellows, greens, variegated, whites and blues. The last two are not prominent as yet.

Care for your canary, keep his home clean and his food wholesome, and he will more than repay you for this attention with the sweet song he sings for you.

MARSH MARIGOLD
A beautiful example of habitat photography

(Left) SPATTER DOCK
Yellow pond-lilies on their green pads

(Right) LOTUS
The author tells of getting this picture

STALKING *the* GENTLE WILD FLOWER

One of the Most Fascinating Fields for the Camera Hunter

by L. W. Brownell

Photographic Editor, Nature Magazine

All illustrations by the Author

HAVE YOU ever gone botanizing with your camera? Have you ever tramped the woods and fields in search of new and rare wild flowers? Have you ever felt the elation that comes with the finding of some flowering plant that you have never before been fortunate enough to discover, or, at least, of which you have never secured a photograph? Have you ever climbed rocky precipices, waded through bogs and swamps, broken your way through tangled thickets, or penetrated to the deepest woods in search for some elusive bloom? If you have never had any of these experiences; if you have never returned, dead tired, after a glorious day, hardly able to restrain yourself from immediately dashing into your dark room to learn the results of your day's work; if you have never experienced the deep satisfaction of watching each negative turn into the thing of beauty that you had hoped it would, then you have lost considerably more than one half the pleasure of owning a camera.

It is, of course, entirely possible that you are no wild flower enthusiast, that the study of botany has never interested you. If so, then my answer is, go out and become one. You will find that botany, when studied from the living flowers in their native haunts, holds an indefinable charm for one who is a lover of Nature. Moreover you will find that there is no better way of learning to know the wild flower than with the aid of a camera, and you will soon find with what increased pleasure you greet old acquaintances when you meet them, or make new ones. You will wonder at yourself that you can find so many more beauties in Nature that, but a short time before, you would have passed by unnoticed.

Wild flower photography, while being one of the easiest of the many branches of Nature work with a camera, nevertheless is not entirely without its difficulties and these sometimes assume considerable proportions. The overcoming of them, however, is by no means the least of the pleasures that one may experience in this work. Probably the greatest pleasure lies in the fact that the search for subjects will, inevitably, take one to places where otherwise he would never be apt

SPOTTED WINTER-GREEN OR PRINCE'S PINE

A beautiful subject for the wild flower photographer to search out and snap

to go. You will meet few insurmountable difficulties.

For really serious work in this branch and to obtain the very best results one must use a tripod camera. After some twenty, or more, years' experience I have never found any reason for discarding the type of camera that I first used,—a 5 x 7 view camera with both front and rear extension of bellows. This latter feature is almost a necessity for work upon the smaller flowers particularly. When it is necessary to have the lens within a foot or so of your subject, as is frequently the case in flower photography, focussing by the front extension so constantly changes the distance between the lens and the object that it is next to impossible to obtain a perfect focus with the image the size desired. By using both front and rear extensions, this may be accomplished with the greatest ease.

The lens need not be a very fast one, in fact one of medium speed is preferable. I have done nearly all of my flower work with a lens working at approximately f.8. It is always desirable to sacrifice speed to depth focus, until such a time as the ideal lens that combines both qualities is invented. The greater the focal depth of a lens the less it will need to be stopped down in order to obtain sharp focus over the entire field of the image and, consequently, the shorter the exposure necessary for a well-timed plate. This is of extreme importance in photographing flowers out of doors, where the least breath of air is almost certain to move them sufficiently to cause a blurred image on the resulting negative. It is also important that all the blossoms of a group, from those nearest the camera to those farthest away, should be in sharp focus, clear and well defined. The only way in which this may be obtained is by closing down the lens, often to its smallest aperture. The very fast lenses have such a short depth of focus that, even by doing this, it is sometimes impossible to obtain the desired results. Always focus the lens wide open and upon that point of the field that is about one-third of the way back, irrespective of the rest of the picture. Then slowly close the diaphragm until the point nearest and the point farthest from the lens are both in sharp focus. It will sometimes be found necessary to close down to the smallest opening and the resulting exposure must be correspondingly long. In which case one can only wait for the quietest possible moment and trust to luck that the wind will allow the flowers to remain quiet during the length of time required for the exposure.

EASTERN PRICKLY PEAR

Another beautiful subject for the botanist with a camera urge

One of the greatest difficulties in the way of making perfect photographs of wild flowers in their habitat is the wind. One hardly realizes how almost constantly there is a movement of the air until he has some reason for paying particular attention to the fact. Had he been with me, one day not so very long ago, on a rocky hilltop almost solidly covered with columbines in full bloom, he would have understood what I mean. I stood there for more than an hour with my camera focussed and my hand on the exposure bulb, waiting for the moment when all the flowers would be simultaneously still. The sun was shining brightly, and with considerably more warmth than was comfortable, and the air was so breathless that the perspiration literally dripped from my face and yet there was never a fraction of a second that at least ten or a dozen of the flowers were not swaying on their slender stems. Of course there are many flowers of such a sturdy growth that they may be photographed even when there is a quite noticeable breeze blowing.

A GROUP OF THE FALSE SOLOMON'S SEAL

Note the background of the tree trunk which gives the invaluable habitat touch

There is no way that I have been able to discover in which this drawback may be overcome except by "watchful waiting" until everything is motionless for the short space of time necessary for the exposure. After working with the flowers for some time one develops a sort of sixth sense that tells him when the plant has composed itself to remain for some little time motionless. In my work for a number of years past I have rarely missed a negative from movement on the part of the subjects and I have made exposures ranging all the way from a tenth of a second to five minutes.

The tripod used should be of the stoutest design as it must be absolutely rigid and able to stand some surprisingly hard usage. The type of folding tripod that is built for compactness, sacrificing strength for lightness, especially the metal ones that telescope, are worse than useless. If one wishes to go to the expense of having a special tripod made, with legs no more than twelve to fifteen inches in length, to supplement his larger one, he will find it to be of great use in photographing the low-growing plants. Also a tilting top is of utmost assistance.

The value of photographs of growing flowers, over those of cut specimens, lies largely in showing their manner of growth and environment, as well as the form of the flower itself. Typical specimens, growing under normal conditions, should, therefore, be chosen and the entire plant included in the photograph

INDIAN PIPES IN THE WOODS

Always attractive and interesting but not always easy to find

where possible. Neither should the plant itself be allowed to occupy the entire plate but enough of its surroundings included to indicate the nature of its habitat. Any grasses, or other herbage, that intrude between the lens and the subject so as to in any way interfere with a clear, uninterrupted view of the latter should, of course, be removed but this should be done with the greatest care that the naturalness of the surroundings may not be in any way impaired.

There are many times when one's ingenuity is all that saves him from complete failure, as a few years ago when I made a special trip to a lake in northern New Jersey to photograph one of our rarest native flowering plants, North American lotus. There are comparatively only a few spots in the country where this plant, at the present time, grows wild. This lake is one of them. I arrived at the small hotel where I was to stay late in the afternoon and early the next morning found me in a boat on the lake. After a row of more than a mile I was at my objective only to realize that my old enemy the wind was again trying to to best me. The field of plants, which covered several acres of the lake close to the shore, was in constant motion. As the day advanced the wind grew stronger so that all I was able to accomplish was to search for, and mark for future use, the best groups of flowers. This would save me some time on the morrow.

HEDGE BINDWEED

The camera must be adjusted in taking such pictures as to bring all into focus

GLOBE FLOWER

Wild flower photography is one of the easiest fields, yet with some difficulties

VIRGINIA COTTON GRASS

An interesting subject that lures the true lover of wild flower photographs

The next morning proved to be much calmer. My boat was a flat bottomed skiff, just suited, I fondly imagined, for setting up my camera. I thought that the large leaves and the heavy growth of the lotus plants would hold it motionless and I continued to think so while I set up my camera and focussed upon my group of flowers. Then I began to have my doubts as I waited to make my first exposure, watching my lens against the background for the moment when it would cease to move. That longed-for moment never arrived. No matter how absolutely still I sat, there was a small motion to the boat sufficient to spoil completely any negative I might have exposed for more than a fractional part of a second. What was I to do? The water where the plants grew was about three feet deep. I had a five-foot tripod, but, unfortunately, the bottom was composed of silt so soft that I could push my oar down its entire length without reaching any hard bottom. However, I knew that to set my tripod on this bottom was my only salvation, and that to do so I must lengthen its legs.

The shore was about a hundred yards away but it consumed the better part of half an hour to push my skiff through the heavy growth of plants. I found some alder growths from which I cut three ten-foot, fairly straight lengths. Flattening one end of each of my sticks to fit the end of my tripod legs, I soon had them securely bound to it, giving me a tripod nearly fifteen feet tall. Pushing myself back to my first location I proceeded to try to find bottom with my most unwieldy tripod. The legs continued to sink in the silt until the tripod head disappeared beneath the water and this without the weight of the camera upon it.

By probing about I found I could locate lotus roots that were substantial enough to form a base upon which to rest the leg. It took nearly a half hour's manipulation of the legs, however, before I finally located them in a satisfactory position. When I had finally done so and saw the image of my group of flowers exactly as I wished it I was ready to send up a prayer of thanksgiving. All this had taken time and it was after noon when I made my first exposure. The wind was again rising so that after making three others I was forced to desist for that day and return to my temporary home. The next day I found that, with each exposure made, the manipulation of my giant tripod became easier and its success was proved when, upon developing the thirty-six negatives which I had made, after my return home, I found that only three of them showed any movement either upon the part of the tripod or the flowers. This method can, of course, be employed in photographing any of the water plants where the water is too deep for the ordinary tripod.

Of course, all of us who have done any dabbling in photography know that, in order to obtain true color values, an orthochromatic plate in conjunction with a color screen must be employed, and where red or orange prevails we must resort to a panchromatic plate with the proper screen. This latter, being sensitive to all red light, must be developed in complete darkness or by a dark room light which is made expressly for that purpose. Naturally the use of either of these plates with the color screen necessitates a longer exposure, ranging from five to twenty times as long according to the density of the screen. The resulting negative, however, is much more worth while. White flowers, or those that are blue, purple or pink may be photographed successfully without the aid of the screen, but any in which there are yellows, reds or orange must be photographed with the screen.

Whenever possible I shade my subjects from the direct rays of the sun in order that there may not be such strong shadows making too contrasty a negative. A day when the sun is slightly overcast and when little or no wind is blowing, is ideal for flower photography. Unfortunately such days are few and far between and we cannot afford to wait for them.

The flower photographer who would make a valuable collection of negatives can afford to pass by nothing in the way of plant life. I have photographed flowers on the edge of a roadway when I was first forced to shake them free of the dust with which they were covered. They happened to form the best group of that particular flower that I had found. I have photographed them in swamps and streams standing to my knees, or higher, in mud and water, I have photographed them from a boat in ponds and creeks, I have photographed them in the deepest woods, in fields, dry woodlands, on rock ledges and rocky hillsides, in salt marshes, grassy meadows and along beaches. I have even photographed them upon city dumps, but I have never passed by a flower because of its insignificance. Incidentally I am quite certain that I have many times been taken for an escaped lunatic while making some of these photographs.

VITAMINES and BIRD DIETETICS

by Dr. George B. Roth

of George Washington University School of Medicine

HOME-MADE though it was, it apparently was hospitable, because the bird house atop the garage was leased by a pair of Carolina chickadees. In due time a family of five arrived and after about three weeks four had left the nest and were found on the ground unable to fly. The fifth had died in the nest. A neighbor's cat reduced the number to three, these being sheltered in a box and fed there by their parents. They were weakling little birds, walking about with difficulty and about able to perch and no more. Something was sorely amiss with these babies.

We watched the feeding habits of the parents and discovered that they garnered the family meals from a feeding table nearby, taking suet and chicken feed,—mostly flakes of suet. Only now and then would they disappear into the handy woods and return with a succulent insect. On the second day after their rescue the first of the three remaining youngsters died, another gave up the bird ghost on the following day, the third escaped.

NO VITAMINES FOR THEM

The chickadees that were unable to thrive on the feeding station diet

What was the probable answer? Vitamine B, known as the anti-neuritic vitamine, is missing from beef fat, or suet. Its lack produces profound muscular weakness in birds, terminating in death within a few weeks. Insects, on the other hand contain this vitamine; moreover, animals must obtain it from plant and animal foods, being unable to build it in their own bodies. This exclusive fat diet also, without doubt, contributed to intestinal upsets from which all of the young birds suffered.

If these conclusions are correct, as they seem to be, it suggests that, for the well-being of rising bird generations, feeding tables might best be closed while the youngsters are getting their start on the foods Nature intended for them, but which the parents are tempted to neglect when this is made easy.

FIRST PRIZE
"A World of White"

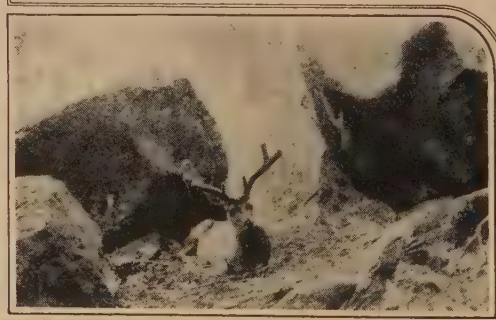
GERTRUDE MUNN
CHICAGO, ILL.

THIRD PRIZE
"Moccasin Flower, or Pink Lady's Slipper"
GEORGE F. COMSTOCK
NIAGARA FALLS, N. Y.

THE PHOTOGRAPHIC CONTEST

Much Interest Shown in First of the Monthly Contests

HERE are the results of the first of the monthly photographic contests announced in the February issue of Nature Magazine. The first contest brought many entrants and the judges were confronted with more than one thousand photographs from which to choose. Many really excellent entries had to be eliminated and all unsuccessful pictures are being carefully returned. In doing so the judges wish to thank all the entrants in the first contest and express the hope that they will send in more entries, and take pictures specially for the Outdoor Good Manners and Garden Contests to come.



HONORABLE MENTION: "Young Blue Jays," CLARENCE M. BEAL, JAMESTOWN, N.Y.; "Great Blue Heron at Home," VERDI BURTCH, BRANCHPORT, N.Y.; "Deer, Yosemite Valley," BELLE WILSON, CHICAGO, ILL.

SECOND PRIZE

"How do you do, Mr. Chipmunk, how do you do!"

MARY BEAL
DAGGETT, CALIF.

THIRD PRIZE

"It's easy after you get the knack of it,' says the Flamingo'"

MYRON RAY CLARK
WOLLASTON, MASS.

THIRD PRIZE

"Early Spring on the Farm"

ETHEL D. MOODY
CHICAGO, ILL.

HONORABLE MENTION

"Moving Time"

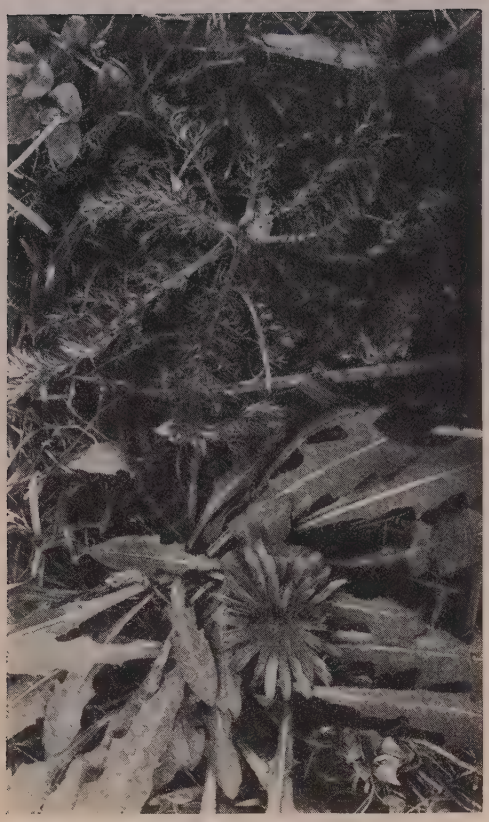
A. O. SIMONDS
TIFFIN, OHIO

HONORABLE MENTION

MRS. S. A. KELLER
HAYDIN, COLO.

ENJOY the LUXURY

Some Excellent Advice on Defeating the Lawn Pests



TWO FAMILIAR LAWN PESTS
Yarrow and dandelion, although it must be admitted the latter has its good points

ABOUT the only touch of Nature many a city dweller experiences is in the front lawn and the contact is sometimes made rather unpleasant by such intruders as buckhorn, plantain, chickweed, crab grass and dandelions. Nevertheless, these unwelcome guests are not altogther uninteresting and they may readily be gotten rid of without a great deal of trouble if one but knows the proper method.

Let us first consider a few of these lawn pests individually. Were a vote to be taken for the worst of all lawn weeds, the golden blossomed dandelion would probably take first place. But dandelions are not without their good points. The flowers and buds are used in the making of a beverage, the roots are utilized in medicine, while the young, succulent leaves may be boiled as greens or salted away in crocks for winter use. Dandelions are able to maintain their supremacy in the greensward principally because of the fleshy roots that live from year to year and the trouble-making habit of producing flowers and seeds so close to the ground as to be entirely out of reach of the mower blades.

Second place would probably belong to the ubiquitous buckhorn, a species that in many respects is similar to dandelion although devoid of wind-blown seeds. The seeds, however, possess the peculiar property of becoming mucilaginous when moist, a characteristic that is utilized in cleaning them out of impure clover seed by a process in which the moistened seed is mixed with sawdust, which adheres to the sticky buckhorn and so increases the size of the individual buckhorn seeds that they can readily be screened out after drying.

Third position in the array of our worst lawn pests probably belongs to chickweed, a weak-appearing little species that is among the hardiest of plants. Unlike dandelion and buckhorn, chickweed is not equipped with fleshy perennial roots, but, instead, possesses fibrous annual underground parts that seem to be exceedingly frail. Chickweed ranks so high among the lawn pests because of its ability to make seeds in large numbers and because it can bloom and set seed during almost the entire

RECOGNIZE THIS ONE?
Yes, it is plantain, a hardy lawn pest that seems to cling to the soil when you pull it

(Right) INTRODUCING CRAB GRASS
But what owner of a lawn in which he takes pride wishes to know this one, except as a means to getting rid of it?

# of a WEEDLESS LAWN

by Albert A. Hansen

Purdue University Agricultural Experiment Station

season. I have seen the handsome little starry blossoms in full splendor during early December and again in February, which gives this seemingly delicate species about the hardiest constitution in the world of annual plants.

But we must not forget that arch enemy of all, turf-creeping, purple-headed crab grass. Like chickweed, crab grass grows from seeds only, but what the species lacks in winter hardiness it more than makes up for in its ability to mature seeds. The most obnoxious feature of this troublesome plant is its nasty habit of dying during summer drought, or at the first touch of frost, leaving ugly bare spots in the greensward.

Now that we have become acquainted with a few of our lawn enemies, it is but natural to ask how they may be destroyed. Most people attempt to get rid of lawn weeds by the back-breaking method of hand weeding, and this is just about the most laborious and inefficient way of all. Take dandelions, for instance, —the more you cut them the more the roots divide and form new crowns until eventually you have a nice mat of the milky-juiced leaves where but a single plant grew before. All of which is rather discouraging. Careful experimental work has amply demonstrated that the time and money spent on hand methods can be far more efficiently and economically spent in developing so good a turf that there is no room for the weeds to thrive—in other words, discourage the weeds by encouraging the grass.

The best way to encourage the grass is to use fertilizer, and extensive tests have shown that ammonium sulphate is the best lawn fertilizer available on the open market. There are two reasons for this;—first, ammonium sulphate is rich in nitrogen and it is nitrogen that produces leaf growth, and, second, it produces an acid reaction that is detrimental to practically all weed growth and not harmful to common turf grasses. Ammonium sulphate must be used with caution, however, or it will burn the grass. Burning can be prevented if this material is not applied at a greater rate than five pounds per thousand square feet and thoroughly watered in either by applying it before rain or by

SORREL IS A SYMPTOM

The presence of red sorrel in your lawn should indicate to you that the soil might be better

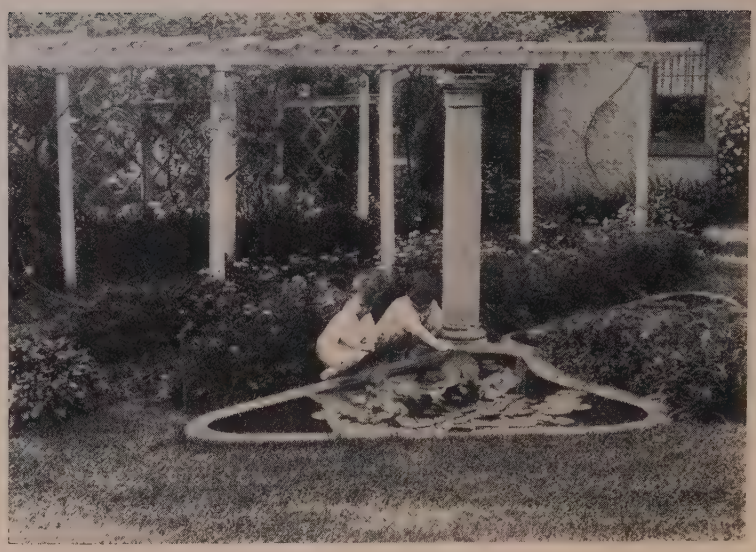
BUCKHORN IS COMMON

It is, in fact, one of the worst of the lawn weeds, perhaps getting second place among the offenders

(Left) BUT THIS IS FIRST

Flat rosette of dandelion, whose flowers often form so close to the ground that they defy the blades of the lawn mower

the liberal use of sprinkling water. Furthermore, sulphate of ammonia can safely be applied at the five pound per thousand rate during the early spring and again during early summer and also during the cool fall months, but it must never be used in the heat of the summer season or disaster may follow.



A LAWN IS A VITAL THING

As a matter of fact, a good lawn is really a work of art

There are some lawns, however, that no amount of fertilizing will ever make perfect. The fault here, and it is an exceedingly common fault, is in attempting to grow grass on the infertile clayey subsoil cast up when the house foundations were excavated, to which frequently has been added masses of waste building material. It is almost hopeless to attempt to grow grass on so poor and unnatural a foundation—about the only thing that can be done to produce a good turf under such conditions is to add a layer of good top soil and start all over again. Fortunately, the layer need not be very heavy—two inches are sufficient for all practical purposes—since grass roots do not ordinarily penetrate very deeply. It is a mistake to spade fertilizer into the ground to a depth of six inches or more as some authorities have recommended, since most of this plant food below a depth of an inch or two is simply wasted. The more important of our turf grasses are surface growers.

Anyone contemplating the erection of a new home should profit by the experience of others and specify that the rich top soil be saved in a special pile before the house foundations are dug, to be used later for lawn grading. This is an important detail to be remembered.

Another common error in lawn maintenance is the use of lime. Actually lime is a great encourager of weeds and it has no place on the average home lawn. This is due to the fact that practically all turf weeds, with the possible exception of sorrel and sour grass or oxalis, are by heredity adapted to sweet land, and lime. Sweetening the soil is ice cream and cake for the motley weed army. Turf grasses, on the other hand, are quite tolerant of acidity, particularly where plenty of plant food is available. This statement is made in spite of the common impression that bluegrass will not grow in sour land, but experiments have shown the opposite to be true as long as the soil is kept reasonably rich.

Owners of weed-ridden lawns frequently wonder where in the world the great army of pests came from. Although it is true that seeds of a few weeds such as the dandelion are distributed by the wind, this is a relatively unimportant source of trouble. The real darkey in the woodpile is the seed used, since most lawn weeds are introduced in impure seed and once started they readily reseed and persist. A little knowledge regarding

THE PESTIFEROUS CHICKWEED IS AN INSIGNIFICANT BUT TENACIOUS PEST

You no doubt recognize it from the opposite, heart-shaped leaves that identify it

WHAT OF THE SHADY SPOTS?
Some rough-stalked meadow grass added to the seed will help

lawn seed may save endless trouble. Experience has shown that the best all-around lawn grass in the northern United States is bluegrass, but the chances of getting good bluegrass seed in the cheap packages of so-called lawn mixtures sold in chain stores and hardware shops are exceedingly slim. For example, twenty-eight samples of "lawn mixture" gathered on the open market in various parts of Indiana,—the mixtures included a number with high-sounding brand names,—contained an average of approximately sixty thousand weed seeds per pound. Used at the usual seeding rate, this would mean the introduction of somewhere in the neighborhood of three hundred weed seeds on every square foot of lawn surface. It is no wonder that our lawns are badly fouled with noxious weeds. Almost as bad was the startling revelation that few of these mixtures contained much bluegrass, the basis of practically all being small-seeded or "bottom" timothy. This sort of seed, the commonest available on the retail market, gives a quick, temporary turf of coarse timothy and weeds that must be reseeded every year to maintain any showing of grass, not a very efficient system.

It is far better either to purchase a good lawn mixture at a reasonably high price from a firm known to be reliable or else practice home mixing. Home mixing is not much of a trick if one knows how it is done. Simply go to a good seedsman, purchase a quantity of bluegrass and red top seed, mix in proportions of three parts of blue grass to one of red top and sow at the rate of about one pound per five hundred square feet. The red top germinates readily and gives a quick, temporary turf that will be crowded out in the course of a year or two by the slower-growing but more vigorous bluegrass. For spots in the lawn too shady for bluegrass, add to the bluegrass-redtop mixture an equal quantity of the seed of rough stalked meadow grass, known to the seed trade as *Poa trivialis,* by far the best lawn grass available for shady places.

Incidentally, the time the lawn was seeded has a great deal to do with the amount of weed growth present. During the spring, when things begin to grow, our fancy turns to thoughts of lawn seeding, but this common practice is absolutely wrong for the simple reason that spring seeding places the delicate young grass seedlings in direct competition with the hardy weeds that naturally grow during the early part of the season. Fall seeding, when the grass shoots are relieved from this ruinous competition, has given infinitely better results by reducing the number of weeds.

All of which brings up another important point. Does it pay to reseed the lawn every year as is practised by

MOST LAWN WEEDS ARE INTRODUCED IN A LOT OF IMPURE SEED
Here are the boat-shaped seeds of the buckhorn, greatly enlarged, of course

many? Absolutely no, if there is any semblance of a stand of bluegrass. The same amount of money invested in fertilizer to encourage the grass already present will yield far better results. Of course if the turf is a stand of timothy, the product of cheap twenty-five-cents-per-pound package mixtures, then reseeding with good bluegrass and redtop is necessary, but once bluegrass gets a start greater returns can be looked for from money spent on fertilizer than for money invested in annual seeding. And the number of weeds present will be correspondingly less as the fertilizer-encouraged bluegrass begins to produce a good, tight, weed-proof turf.

A fine, velvety carpet of grass is a work of art that is one of the finest products of nature. There is a thrill to the production of good greensward that can be gotten in no other way, a thrill that quickens the heart beat, soothes the mind and gladdens the eye. The growing of a luxurious weedless turf is profitable from every viewpoint since a good lawn will add materially to the value of any home, as well as to the owner's self-satisfaction.

Buffalo Tree Hoppers

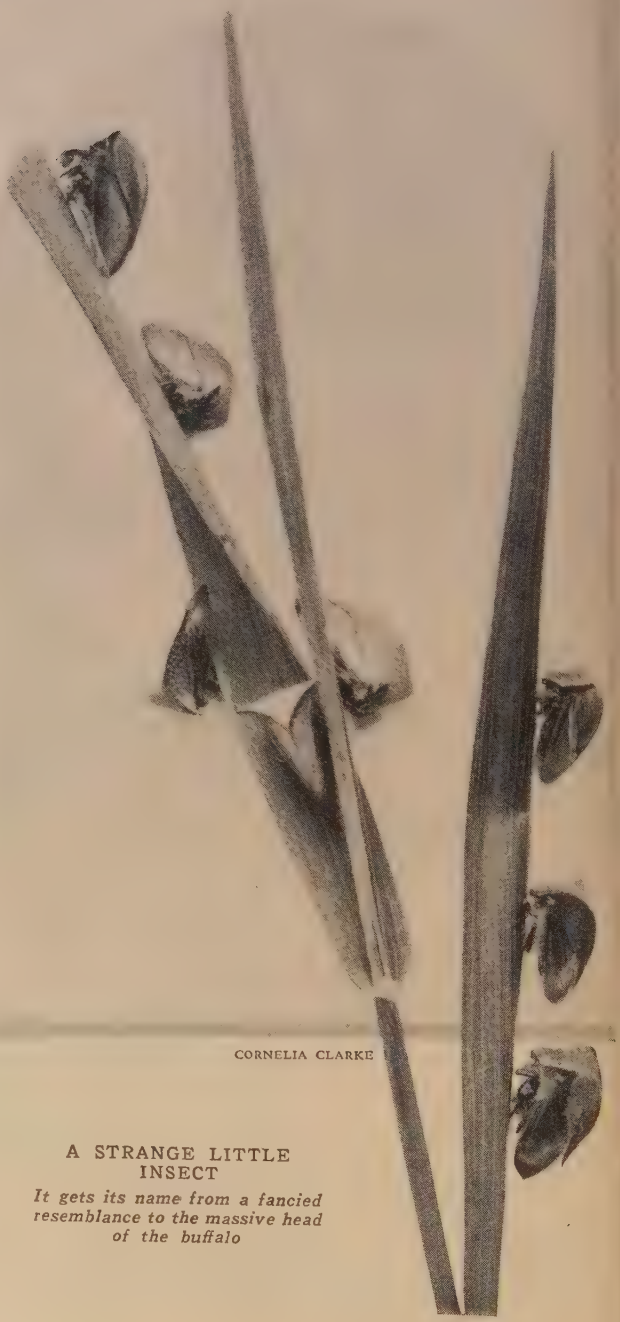
by A. B. Champlain

THESE LITTLE grass-green insects, about three-eighths of an inch long, belong to a strange and remarkable group whose thorax takes the most extraordinary and varied forms. If we could picture a dozen different kinds of tree-hoppers perched on a twig in a row, we might think that grotesque and eccentric forms had run riot. Developed in the most extraordinary manner, the pronotum or first portion of the upper part of the thorax is expanded into a horn-like projection at each side. From this the popular name was derived—a fancied resemblance to the front of a male buffalo.

Quick and active, it flies with a distinct buzzing noise. Six legs, of which the hinder pair are more lengthy than their fellows, bespeak endowments of a leaping character. This, and the curious triangular shape, will complete to all appearances the somewhat odd-looking figure of our little insect. Adults and young feed upon all sorts of succulent vegetation, subsisting upon the juices drawn from the living plant tissue.

Buffalo tree-hoppers sometimes become troublesome pests. The mother tree-hopper chooses to lay her eggs in twigs of various trees, including apple and other fruit trees. To do this she must cut slits in the bark with her egg-laying apparatus or ovipositor. One cut for the egg, and, with instinctive foresight, another to insure the deadening of the adjacent bark to prevent the egg from being crushed by further twig growth.

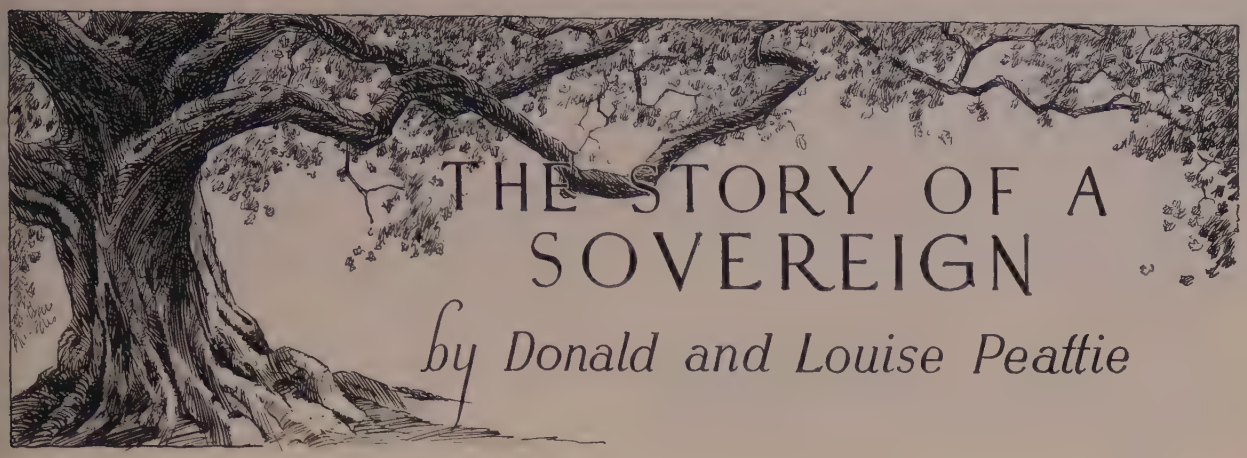
In general the characteristics of the young tree-hoppers or nymphs that hatch from the eggs resemble their parents. The only apparent difference is that they are wingless and are covered along the top with numerous barbed projections. After changing their skin or moulting a number of times, growing with each change, the rudiments of wings appear. Finally these are developed without any other particular change in outward form.



CORNELIA CLARKE

A STRANGE LITTLE INSECT

It gets its name from a fancied resemblance to the massive head of the buffalo



THE STORY OF A SOVEREIGN

by Donald and Louise Peattie

Decorations by Garnet Jex

IN DARKNESS life begins and in dark earth is its ending. The great old tree that made a shade from sunshine for man and beast, that sheltered them from storm, had its tiny, blind beginning with only the worms to know it. When the wordless message of spring went trembling through old earth, the acorn felt it, lying deep among the grasses, and in it life miraculously awoke. The thin strong shell of the nut split slowly, and the sprout pushed forth, faint green, feeble, potentially a giant in strength. The slow grubs breaking up the earth saw it, and the busy little ants running up and over the grasses, but as it grew, as the root turned downward, nosed its way into earth, laid hold on earth, on life, no one knew it but only the fumbling worms, and they have no eyes to see.

A feeble beginning, that; so long ago that white man had never even seen the woodland where the great oak was born; it belonged to the buffalo and the vanished passenger pigeon and the lordly Indian. Without will, without consciousness, the seedling yet struggled on, putting down roots, pushing up stem and leaves, branches and yet further sprouting branchlets. But before ever it had seen the light an overpowering force was waiting to defeat it, a poplar towered close above it, shutting out the sun, lowering with great branches. Season after season the oakling strove and pined. Below the poplar at the marshy edges of the river, the little low white violets grew, undaunted by shade or low hung boughs. But the little bur oak's summers were numbered.

It is a haphazard maze of chances that makes Nature's pattern. Because an unformed, instinctive notion to move shaped itself in the furry dome of a beaver's head, because the river bend below the poplar struck him and his fellows as just the site for a new settlement, came the end of this one of countless silent forest struggles. It took a long time for the beavers to gnaw through the trunk. There were more than a hundred rings in that mighty bole, each ring marking a year's growth, and there were only little bright chisels to cut it through. The beavers worked with a noisy deliberation and persistence, and when one was tired there was always another at hand to take up the work. At last, by their instinctive craftsmanship, the bright-eyed, secret little toilers knew their labor almost done—

When, "Slap!" went the tail of the old sentinel beaver down river, the flail of the big paddle coming down like an explosion on the surface of the river. And Slap! Slap! Slap! the danger signal was passed up stream for a quarter of a mile, with incredible speed, so that the beavers who were at work up in the oak woods heard it half a minute later and scurried for safety. The sentinel, older and more daring than the rest, lingered just long enough on his fallen log to see the forepaw and the evil, sniffing nose of the enemy emerging from the riverside weeds. Then baring his teeth in a grinning snarl, the old fellow, too, dove into the water with a last defiant fillip of his tail. The lynx, stepping with circumspect elegance, picked his way among the arrowheads and pickerel-weeds, sniffing; very gingerly he put a tentative paw into the water, and cat-like he pulled it out again and shook it daintily. Disgusted, he skirted the river's marge and slunk away. Ten minutes later a little seal-like head rose dripping from the water; then another and another, and presently the beavers came back, two and three together. The work of chopping down the great tree went on.

An hour after the stealthy passage of the lynx, the labor of weeks came to an end. There sounded a warning crack, and a painful creaking as the last fibres of the nearly severed trunk were strained. Then, slowly, faster, and faster, the giant swayed, toppled and fell with a roar. Beavers leaped for safety. Birds that had nested in that high green security shot up with screams and chatterings; an egg or two spilled out, and with a final crashing of boughs the old monarch sank to the earth, leaving a great hole in the roof of the forest, through which the unaccustomed May sunlight shone down in a broad shaft.

And that is how the little seedling of an oak that had stood

beneath the shade of the old fellow and grown crooked with trying to writhe into the sunlight, and, puny and blanched from the dense shade, got its chance. In the weeks that the beavers spent in stripping the bark and cutting the poplar up into logs of convenient length, and in digging a canal from the river for a hundred feet through the low swampy grasses to its base, the little oak expanded. Buds that had lain dormant put forth leaves, and the pale foliage turned dark and lustrous. Very lop-sided and absurd were those young leaves. And so indeed they continued for many years, whilst slowly the little sapling got its growth. First it was short and stubby, and then, like a growing child, it was long and stringy, and in fifty years it was past the dangers of infancy and in its vigorous youth.

It had branches enough now and leaves enough to give shelter and concealment to a few nests, and little siskins and warblers visited it on their yearly flights north and again south, and hopped about among its rooms and peered out through its windows at the sky.

And in a hundred years it had attained a glorious stature, its trunk ten feet around at base, the spread of its branches fifty feet. For fifteen feet its trunk shot up like a thick column; then great twisted arms spread at right angles and swept low toward the ground. Sparse were its branches and thick, like sinewed arms, and a great armor of gray bark was on its trunk and its chief limbs, a bark furrowed like the brow of a wise old man, with deep trenches and great broad ridges.

Spring came late for the bur oak; the white violets returned to the soft mucky ground between it and the river. Spring beauties, shell-pink, rose-pink, and palest pink, nodded beneath it; and still the great oak slept. Then, very slowly, it put forth its tassels and catkins that were its flowers, and little by little the young leaves stole out. "When the oak leaves are no bigger than a mouse's ear, plant the corn," said the old men to each other in their smoky wigwams, and the squaws with their babies strapped to their backs were set to hoeing the corn hills.

Summer came, and red-headed woodpeckers and flickers flew to the oak's branches; they rapped their hammers on its trunk and heard no echoing hollow, and flew away disappointed. Little nuthatches and black and white warblers ran up it and down it and round and round it, looking for insects in its bark; but the bark was too healthy, and the birds found little dinner. Crows visited it, but not for long; they love the silvery branches of dead old trees. Broods of young pewees and orioles were raised in its branches. Through the hot days cicadas shrilled there, and the seed set and ripened.

Then autumn. Then the blue smoke of asters at the foot of the oak, and the real smoke, pungent, bitter, of the prairie fires to the west where the Indians drove the game from the great pastures, to corner and kill herds of deer; then the blue smoky haze of October, while the acorns ripened and fell. Big were those acorns, with broad shallow cups rimmed with a moss-like fringe; lustrous nuts of a hazel brown with firm bland kernels that the squirrels broke open and devoured, or stored in older hollow trees, or buried in the ground in places that their feckless minds forgot.

Then November, when the stored food of the leaves was with deliberation withdrawn, leaving the useless chemicals to mingle and run together like pigments of a painter's tubes, so that the summer green turned to gold and gold to orange, and orange to vermilion, scarlet, crimson and maroon. And when the last drop of sap was buried deep in root and trunk, slow hardened layers grew across the base of the leaf, stalk, cutting it adrift, so that the leaf twirled slowly downward through the frosty air or was caught on a roaring wind and sent spinning, driven through the woods, to be spiked, perhaps, against the thorns of the little red-berried hawthorn thickets.

And so the long winter came, when the squirrels rolled into balls, and the beavers swam under the river's ice, and the oak slept a long sleep. Little flurries of Lapland longspurs and horned larks and snowflakes went through its branches like drifts of the blizzards. And when the snow was deep and the stars were out, the owls hooted, and the brittle limbs of the old trees creaked answer as they strained in the wind. Ice storms came, with the clattering of sleet, and froze on the branchlets, coating them day after day with ice, weighing them down, straining them, pulling, but the arms and fingers of the big bur oak would not break under this torture. At last the sun came out, and the whole tree glittered in an armor of ice an inch thick, dazzling to look upon, creaking and rattling in the wind—tried but triumphant. One by one the fingers of the ice relaxed their grip, dripped away, vanished. Thaw had come; balmy days had come. Spring might hesitate distantly, but the back of winter was broken.

And so for a hundred years more the great oak stood. It grew more slowly now; but still it grew. Here and there a branch died. The trunk became more wrinkled every year, and the outer bark was softer now; bark-boring beetles, like little miners, began to bore it, letting its sap out in thin trickles. Gall flies stung the branches with their egg-laying swords, and as the eggs hatched the little maggots secreted a slow poison that goaded the tree's cells into strange action. Great woody lumps spread out over the limbs where the eggs were hatching, and one bigger than all the rest took on the shape of an old man's head, winking one eye. The passing Indians saw it, and pointed it out to each other, with guttural laughter, but their little naked children ran on ahead, looking back afraid. The old oak was a personal thing now, looked on with awe, venerated, protected.

Then one day there was a council under the old oak. Came a stranger in a cocked hat and with gold epaulettes; pale-faced soldiers were with him, strange stiff men out of warlike Europe. When the man with the

epaulettes arose to speak, the soldiers beat a roll upon the drums. When he had spoken, showing his gifts of guns and horses and rum and powder and copper kettles, an Indian repeated the words, in the tongue of his own people. Then the old chief put his pipe from his lips and arose, and the drums beat another solemn salute. He spoke, and he too waved his arm in broad gestures, toward the oak woods and the prairies. When he had finished all were seated, and passed the calumet, the peace pipe, and said no word till the smoke was finished. Then a priest in long black robes came forward, and raised a strange thing in his hands, a cross of wood, of Norman oak. A flag was unfurled, a white silk banner with blue lilies blazoned on it; the Frenchman and the old chief clasped hands, and the guns were fired. But it was all one to the great bur oak above them, whether the ground from which it drew its strength were ruled by red Illini, by Frenchmen, or the men of the new America that was yet to be born.

Sometimes a French trapper set his snare beneath the oak and caught a lynx, perhaps; sometimes wandering bands of Indians filed by, but for months on end there were only sun and wind and storm, and wild things in the leaves and grasses, and the years rolled on.

There came a day then when a new sound was heard, the creaking of wheels, and a covered wagon lumbered out from shadow and drew to a halt. Strong-eyed, slow-spoken, the pioneer unhitched his oxen and turned them to grass; out of the wagon children tumbled, shouting, to stretch their cramped limbs in heady races, with the big oak for a goal, and a woman with tired eyes and hands walked slowly in the dewy grass, picking a handful of the black-eyed susan, the ironweed and the vervain, and so came at last to rest upon one great mossy buttress of the tree, and know that here home was to be.

The oak-opening rang day long with the blows of the axe now, clanging silverly in primeval stillness. An open-faced shelter of poles and boughs stood across the glade, and there the woman daily bent over the kettle, till at last with flushed face she came wearily over the grass and rested on the big oak root, with her cheek on the great rough bole. The wind in the leaves went murmuring above her; there were always little shy, friendly bird folk there, hopping about, watching her, and when she tilted back her head and stared up in the dappled sea of leafage perhaps for a little she dreamed that she too was winged and could leave hard earth at will for the happy life of the tree-tops.

One early autumn day the man came too, striding across the frosted grass with his axe, and the big tree rang as though with a cry when he swung the helve and struck. The woman came running, crying aloud, and put her hand on her husband's arm, protesting, pleading; he laughed, and looked up in the leafy tower, and leaned his axe then gently against the tree. After that the oak was safe; the little girl in her red petticoat brought her small brother to play at doll tea, there among the roots, with acorn cups for dishes; when the wind was south and soft with spring it blew the smoke from the new log house to tangle in the budding oak boughs.

The scar of the axe blow healed, through the seasons; the smoke of log houses rose here and there all about. The children were grown; sometimes in twilight two young folk walked arm in arm under the oak; there were other children, and in winter red-eared boys with muskets and fur caps coming to track squirrel and rabbit and fox and beaver through the snow. Every man had a bearskin rug and a beaver cap, and if they lost one it was easy to get another. And then there were no more bears, and no more beavers; wolves were gone and foxes hid warily, and only the rabbits and the chipmunks, hounded, but free from the terror of the wolf and lynx, jumped in the frosty weather beneath the oak.

The tree was old now, like an empire that cannot hold off its enemies. A great plague of leaf-eating insects descended upon it, and it would have died of them but for a destroying host of wood birds, returning from the north, that fell upon the smaller foe and ate, and gabbled and ate. There was a year of great flood, because the white men had cut down the forests at the headwaters so that the run-off was not held. Day after day it rained, and the muddy waters of the Desplaines rose, and shouted, and were at war with the world. The meadow with the white violets was drowned; the water crept up and up, over the banks, into the oak woods, and boys floated rafts about among the old trunks, and splashed and shouted, setting the echoes ringing.

Next year there was a great drought, and this too was the fault of man, who had cut down the guardian forests at the headwaters. The leaves of the oak yellowed in July; by August they had fallen. Fire broke out, and swept the prairies, and crept smouldering and sultry into the oak woods; it leapt like a rabbit through the undercover, and licked the great outer armor of the oak trunk, but could not burn it, and went away, red and sulky.

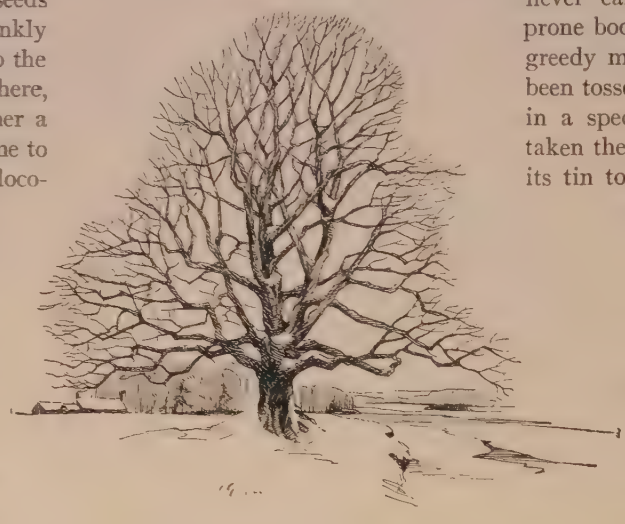
And now the leafy kingdom could keep its outer defences no longer; one limb and then another died, and when a great one fell it tore a hole into the heart of the tree and showed that that heart had long been hollow. One year an owl lived there, and another a family of squirrels, and finally an irritable, dog-worried raccoon made it his castle from which he snarled down at his pursuers. Then boys came with fire and smoked him out, and left the fire to burn, so that it ate a great hole out of the base of the tree. After that an uproarious army of touchy wasps lived in the top of the hollow. Once, when the moon was silver, a girl whose grandmother had been a little maid in a red petticoat, ran laughing to hide in the hollow, and there she was found, and only the old tree, that shut away the moon's eye, saw the be-

trothal under the benign and sheltering boughs.

The years rolled on, and the boring beetles found the oak, and riddled its stout old sides. Weevils, flat, triangular, beautifully mottled with light gray and dark gray, perfect mimics of the bark of the bur oak, crawled in the ridges and furrows of the armor plates, and sharp-eyed birds hunted them up and down and round and round—the nuthatch and the brown creeper and the warbler that is black and white like bark. At the base of the tree bracket fungi burst out like little shelves, Polyporus, the many-pored, the white-spored, the slow-devouring. Into the wood it sent its invisible soft threads and sucked the wood; into the air it pushed its spongy brackets.

Now in the winter wood mice sublet the nests of robins that had gone south—robins were getting plentiful now, but gone were the pigeons and the ravens of olden days. And there in such a high cold nest the little huddled family swayed all winter, while the wind rocked the furry babies and sang to them the songs of the woodland.

Through the woods sheep strayed, bringing alien weed seeds in their wool to spring up frankly prone body, for in that tornado the underbrush; there were fences here, and roads. Where for a summer a steam crane snorted, tracks came to stretch shining, and when the locomotives thundered through the woodland the ground where the old oak stood rooted was shaken by their passing. Then down the river the clamor of building was followed by a new sound, a strange, high whir, as of the chorusing of a million cicadas, and smoke belched forth like the brushfires of October. A saw-mill had come to the bur oak woods. Its iron teeth on a whirling blade were eating the forest away. It had taken twenty acres already, leaving a desolation of stumps behind it, stricken and useless. And then there came a day when two men walked under the giant oak and stood and talked and spat. And after talk one raised his axe and smote, cleaving a silver sliver in the oak side, a mark for death.



"We'll have her down this afternoon, Bill," the other man said, and turned away.

This is a doom for which Nature has no counter-doom; this was sure death that was coming to the great old giant, coming to the oak where it stood rooted, in the first-leaf of April with the tender winds wandering among the leaves to touch them and blow by.

But there were strange doings in the sky to the westward; hot breaths and cold breaths of air were brewing dark forces. On the sunset margin, looking off toward the prairies, a little cloud pushed up, like a clenched mailed fist. Then like a toppling tower it shot up, a dark pillar of wrath, a whirling column of destruction. For a moment the wood held its breath, and the young trees in leaf and the dead, forever naked, waited its coming. And it came, with a gust, with a rush, with a roar, with a scream of death. The old oak writhed a moment in agony; it was turned on the rack, one awful twist of the wheel, then it fell, as a monarch falls, in his armor, with his face in the grasses.

So passed the old oak. Men never came to saw up the great prone body, for in that tornado the greedy mill and its steel saw had been tossed away like straws. As if in a special hatred the wind had taken the roof of the mill and bent its tin top in a hundred knots; it scattered the lumber piles as breezes scatter chaff and strewed the machine in separate broken pieces through the wood and the river.

But the burnished beetles used the oak for a hiding place, and children came back to play on its fallen flanks, and the wood mice built again in its hollow. And still on wintry nights you may hear them, giggling and chattering in the snug depths of its heart. It took a hundred years to grow, and it lived a hundred in glory. For a hundred years it gave up that glory inch by inch till it fell, and now for many years it will lie there, while the little jewelled beetles work at it, turning it back to earth, to its mother.

Among the outstanding articles in the May issue of Nature Magazine will be one by Hugh Stevens Bell on the deer of the Kaibab. Miss Lorene Squire contributes another of her entertaining stories of adopted wildings and illustrates it with her fine pictures. Stephen Haweis gives us another article from the Smithsonian-Chrysler Expedition; Donald C. Peattie writes of the Lotus; A. B. Champlain presents another insect tale and A. B. Brooks takes us flashlighting the snowshoe hare. The May issue, incidentally, will reach you earlier than usual due to a change in printing schedule.

LUNCH ALONG THE TRAIL
The trail may lead far from camp and a cook is valuable among the trail makers

A TRAIL PROGRAM for the CAMP

An Essential Phase of Well-Rounded Camp Activity

by William G. Vinal

Director of Nature Guiding for the American Nature Association

This is another article in the group based upon the summer camp tour made by Dr. Vinal for the American Nature Association. It treats with an important phase of camp activity.

WHAT does the country around the camp hold in things of interest and charm,—not the obvious things but the ones to be sought out? What interesting trees people the neighboring forest; what flowers hide beneath it; what boulders tell stories of the past; what bogs and caves and brooks does the land afford? These are questions the answers to which the natural wanderlust of every true camper makes him wish to know. Hence the trail program, an ideal,—in fact, an essential,—part in well-rounded camp activity.

Most camps have admirable trail facilities and opportunities and are beginning to appreciate them. The first thing to be considered, however, in planning a trail program is adapting it to the locality and to the camper, rather than trying to make the camper and the locality fit into a preconceived program. This means a study of the camp and its environs and those who make up the camp community. There are a number of basic suggestions general in character, however, which may serve as guides to the progressive camp director.

Preparedness is the first step to be considered from the camper's viewpoint;—he must be prepared against being lost. The use of the compass, then, must be learned, as well as how to use a watch in bright weather in place of a compass. This can be a fascinating experience itself. For example, a camper may be blindfolded and "lost" in the wilderness, equipped only with a compass, knife, sandwich and two matches. Let him get out of his predicament, preferably with an older camper delegated to trail him without being detected. This, incidentally, is excellent experience in trailing. Other games that will teach the use of the compass, such as finding hidden treasure with its aid, can be devised. An intimate acquaintance with the story this trembling needle tells, however, is essential and I have seen leaders award merit badges for compass proficiency who themselves could not use it.

Thus prepared, the next step may be obtaining a topographic map of the vicinity from the United States Geological Survey. This map will give contour lines and waterways and the camp may be divided into teams to play trailing games and plan trunk trails in accordance with the map. These main trails may lead to a mountain summit, an old mine or quarry, a lake, a deserted village, or any other destination that will appeal to the wanderlust known as "the lure of the trail." Those who can use the map with the greatest ease may be given the title of Map Trailers.

The camper ready and the trail planned in theory, the next move is to submit to the test of reconnaissance before it is actually adopted and trail building begun. A team should try out each trail, tying white rags about every fifty feet to serve as preliminary markers. Items of interest which may be discovered along the way should be marked on the map. These may include caves,

big trees, springs, polluted areas, views, minerals, rare flowers and various trailside interests. Those who show skill in reconnoitering may be known as Pathfinders.

Actual work on the building of the trail can now be considered. For this such tools as a cross-cut saw, axe, shovel, mattock, brush hook, knife, compass and whetstones are desirable equipment. In camp a grindstone or emery wheel is advisable, and every camper should know how to handle and care for these common tools of the trail. Certain rules relative to handling them should be emphasized, the first being to keep them sharp and knowing how to do so. It is unadvisable to plan "cutting contests" between unskilled campers and there should be frequent demonstrations. The camper skillful in wielding trail tools may be crowned Trail Artisan.

SOME TRAIL HINTS

Do not cut trails across other people's property without written permission.
Observe camp sanitation rule when on the trail.
Trails should be narrow for single files.
Cut out all fallen logs, dead trees, and roots that will trip one up.
Grub out brush in the tread.
In overhead clearing allow for wet branches hanging down.
Trim branches close to the main trunk without scarring the trunk.
Go around live trees.
Take out loose rocks and lay flat rocks across wet places.
Pile brush where burning will not injure trees.
Burn brush on a wet day when there is no danger of forest fire.
Guard against opportunities for cross cutting.
Avoid excavating and bridge work.
When bridge building is necessary send for Boy Scout publications for directions.
Go around swamps—corduroys are expensive.
Fords are preferable to bridges.
Be on the lookout for fine views.
Cut trees to open up views. Leave trees to frame the view.
Provide natural log or stone seats.
Skyline trails should follow the crests of hills.

We are now ready to set about building a trail and the best method is to divide the campers into teams of eight headed by a mature and experienced camper. Each group should be equipped with a cross-cut saw, whetstone and two each of the other trail-building tools. The members of the squad should work in twos and each have a chance at grading, rock building, trimming and grubbing over the section of the trail assigned to them. The title of Trail Maker will be voted by the members of the crew to those who do their part joyfully and cooperatively.

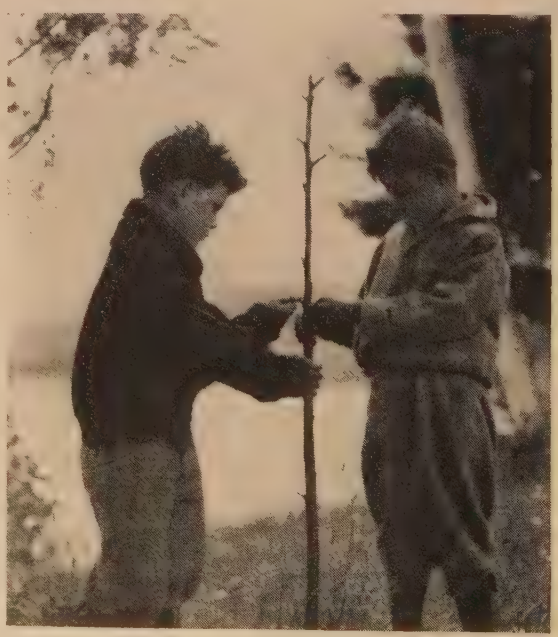
"Blazing a trail" is a familiar expression but really painting white spots or bands on the trees is a better method than the axe blaze and does not seriously mar the trees. Smaller stones atop larger ones should mark the trail also. At cross trails rustic signs in keeping should be erected, placed on posts at about five feet from the ground and carrying the name of the trail, its destination, direction, and distance data. A wheel may be used to measure the distance. Along the trail interesting things should be marked, such as trees, ant nests, rare plants, outcrops, ferns and animal tracks. It is well to post information on trail etiquette, such as: the non-stripping of the white birch; the non-pollution of a spring; the prevention of forest fire; the leaving of a rare orchid in place; not to disturb a nesting wood duck; beware of poison sumac.

Safe fire building is one of the first essentials for trail builders. A camper should be able to select a safe place to build a fire, put a fire out properly, take the wind into account, gather the right kind of tinder, have reserve material, lay a fire correctly, light it with ease, use good judgment and adapt himself to circumstances. When he can be trusted in these matters he becomes a Fire Builder, giving him the authority to supervise and test others, to give permits and to decide on the location and building of fires along the trail.

The trailers should also know how to cook because trail building often leads far from camp. There are plenty of good books on camp cooking. First aid should also thoroughly be known and Red Cross pamphlets are excellent for this. One should also know how to test drinking water and how to make it safe.

Along the complete camp trail there should be many trailside stations. There can be camp craft areas, bird blinds, feeding stations, tree houses, a sugar house and other things selected by the crews themselves. An Adirondack lean-to along the trail with a bed of boughs and a fireplace in front adds to the interest of the trail.

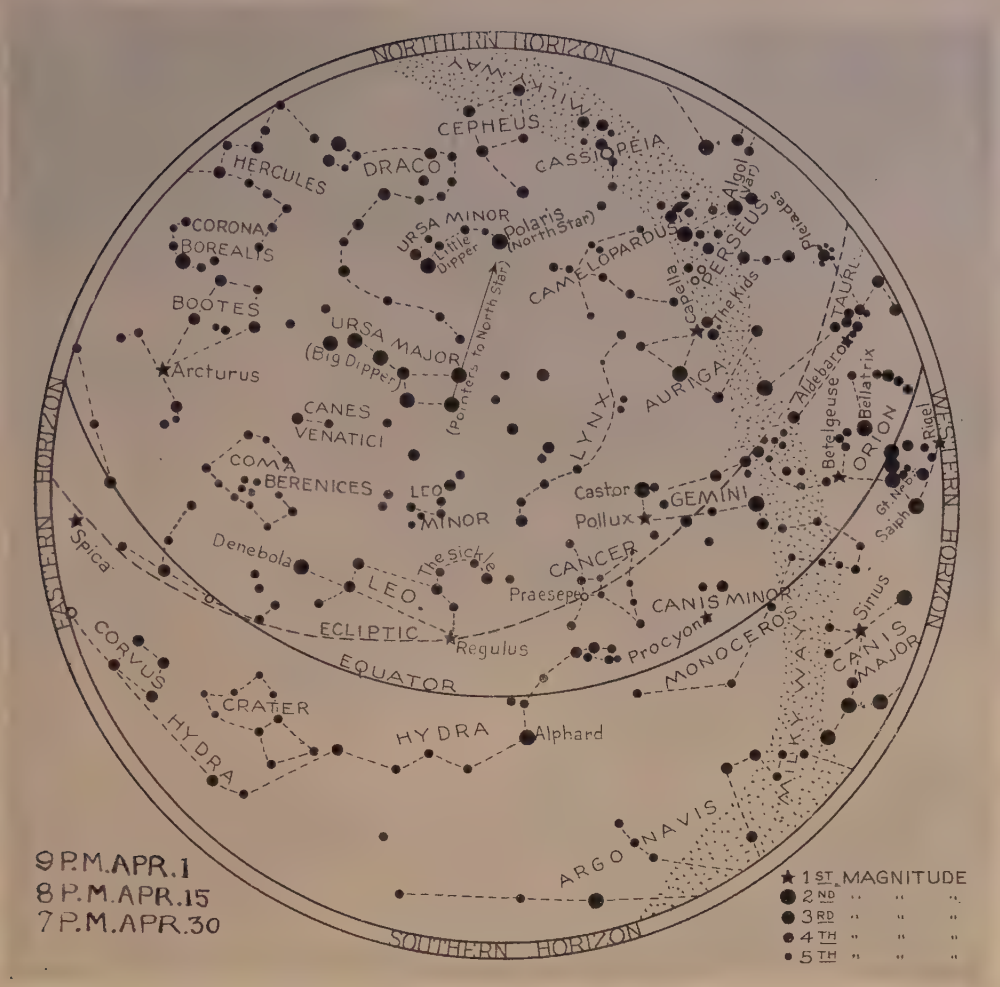
A trail Committee might be appointed by the Camp Directors' Association to make a thorough survey of the situation. It might be possible to have the primary trails meet other camp trails and become a part of the network of the mountain club trails. The committee should keep in close touch with the New England Trail Conference.



FAY WELCH

WHAT DOES THE POPLAR TELL?

These Tanager Lodge boys can read the story of a severe winter past and deer that ate off the foliage



TO USE HOLD OVER THE HEAD WITH TOP TOWARD THE NORTH

WATCH *for the* ZODIACAL LIGHT

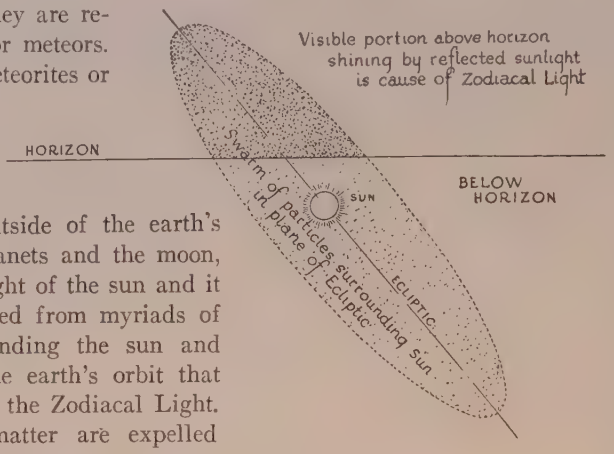
It Is Best Seen After Sunset In Early Spring

By Isabel M. Lewis

Now is the time to look for the Zodiacal Light in the western evening sky as twilight deepens into darkness. Like the planet Mercury it is not readily seen unless one knows just when and where to look for it. Choose a clear, dark evening when the moon is absent and, facing the west, look through the constellations of Taurus, Gemini, Cancer to The Sickle of Leo for a pyramidal or cone-shaped light, fainter, generally, than the Milky Way, with its base from ten to twenty degrees wide. It is resting on the horizon, its apex lying somewhere among the zodiacal constellations mentioned. The distance to which one may be able to trace it will depend upon the latitude of the observer and the intensity of its light. In the tropics the zodiacal light is a most conspicuous and easily observed phenomenon and may frequently be traced from the western to the eastern horizon in a broad band of diffused light.

The explorer Humboldt was much impressed by the appearance of this celestial phenomenon, which he observed extensively on his travels, and he noted in his writings how astonishingly it increased in extent and brightness as he neared the equator in South America and the Pacific. He likened it at its brightest to the most brilliant portions of the Milky Way in Cygnus, Sagittarius and Argo, and told of the great variations in the intensity of its light at different times. His description of it as "a ring of Zodiacal Light" was challenged by the great astronomer, Sir John Herschel, who failed to see any likeness to a ring of light and who wrote of it as "a cone of lens-shaped light extending obliquely upward and following the course of the ecliptic or rather that of the Sun's equator." It is probable that the difference in latitude of the two observers accounted for its difference in appearance to them, since Humboldt described it as it appeared in the tropics where it reached entirely across the heavens, while Herschel observed it under far less favorable conditions in England. Thus points of view vary.

The explanation of the Zodiacal Light that is most generally accepted is that it is caused by the reflection of sunlight from dust-like particles of matter which surround the sun and lie in or close to the plane of the ecliptic,—which is the plane of the earth's orbit around the sun. These particles of matter, often spoken of as "cosmic dust," are to be found throughout the solar system in swarms or clouds and when they enter our atmosphere they are referred to as shooting stars or meteors. The larger masses are the meteorites or fire-balls and the friction produced by their passage through the earth's atmosphere causes them to be heated to incandescence. Outside of the earth's atmosphere they, like the planets and the moon, shine only by the reflected light of the sun and it is the combined light reflected from myriads of such small particles surrounding the sun and extending to and beyond the earth's orbit that produces the phenomenon of the Zodiacal Light. These small particles of matter are expelled originally, it is believed, from the sun itself, either through its great eruptive prominences or its coronal streamers, or both. Light pressure may be the means of driving away minute particles of matter in the atmosphere of the sun and in its prominences and corona into the outer space wherein lie the planets, asteroids and comets. The Zodiacal Light is one of the signs of the existence of this sun-dust, as we might call it, throughout the solar system, but in greatest quantities between the orbit of the earth and the sun.


Visible portion above horizon shining by reflected sunlight is cause of Zodiacal Light
HORIZON
BELOW HORIZON
SUN
Swarm of particles surrounding sun in plane of ecliptic
ecliptic

There are some who believe that the Zodiacal Light comes from swarms of particles surrounding the earth rather than the sun, something like the Rings of Saturn in their nature but not necessarily in the form of distinct rings. A very recent and interesting theory of the cause of the Zodiacal Light is that it is produced by the reflection of sunlight from very small particles of iron expelled originally from the sun but coming within the earth's magnetic field and arranging themselves along the magnetic lines of force in the well-known way of iron filings surrounding a magnet.

The earth is a great magnet with magnetic poles and surrounding magnetic field into which, it is possible, meteoric particles may be drawn. It is also a fact that meteors are composed largely of iron. If due to light reflected from such particles the Zodiacal Light would be most noticeable in the earth's equatorial belt where the magnetic lines of force are widest and where the particles would extend to greatest distances from the earth. Also it would best be seen at the time of the equinoxes when the sun is at the equator, and its path rises most sharply from the horizon, that is, after sunset in the spring and before sunrise in the fall.

Another apparition more difficult to observe even than the Zodiacal Light is the Counter-glow or Gegenschein which lies directly opposite the sun and is a faint oval patch of light about twenty degrees in extent. This light is believed to be reflected from swarms of particles lying beyond the earth's orbit and in line with earth and sun at a point where the rival attractions of earth and sun are nearly equal and as a result the particles of matter eddy around in a whirlpool of motion.

Few have ever been fortunate enough to see the Counter-glow, as its light is so extremely faint, and to succeed even in tracing the cone-shaped glow of the Zodiacal Light from the horizon to the point where it fades gradually away into the background of the sky is quite a feat, even at this most favorable time of the year. No effort should be made to search for these fainter celestial phenomena under the glare of city lights or in the presence of moonlight.

There are no planets to be seen in the evening sky this month. Jupiter, which has been such a beautiful and conspicuous object in the evening sky for months, is too close to the sun to be seen this month. It comes into conjunction with the sun on April 6 when it passes from east to west of it, or from the evening to the morning sky. It will be lost to view in the glare of the sun's rays until about the middle of May.

Venus is still a Morning Star, low in the east at sunrise, and though always a brilliant object, it is not in a favorable position for observation this month. Mars is in Aquarius and is low in the southeast at sunrise. As it is still on the far side of its orbit from the earth it is not now a brilliant object, ranking with the second magnitude stars in brightness. Saturn is the most favorably placed of all the planets in the morning sky. It is in Scorpio, to the northeast of Antares, and is noticeably superior to it in brightness. It will be found on the meridian due south at 3.40 A. M. April 15. Mercury is not in a favorable position for observation this month. It will be in conjunction with Venus on April 8 and about one degree south of it but while Venus will be visible because of its great brilliancy it will be a difficult matter to find Mercury in the twilight at such a low altitude above the horizon.

A conspicuous configuration in the evening sky this month is The Sickle in Leo which is now approaching the meridian high in the eastern sky. Regulus in the handle of the Sickle is almost exactly on the ecliptic and is one of the stars frequently "occulated" by the moon. It is included in the list of the twenty brightest stars though it is the least brilliant of them all. The Leonids, the swarm of meteors that appears yearly about November 15 in the early morning sky has its "radiant" in the Sickle of Leo, that is, the swarm appears to come from this general direction in space. The Sickle also outlines the head and breast of Leo and Regulus is also known as Cor Leonis, or The Heart of the Lion. Regulus is one of the nearer stars. It is about thirty-two light years or nearly two hundred trillion miles distant from the earth. This is about three hundred and thirty thousand times the distance of the sun from the earth. Yet Regulus is one of the *nearest* stars.

DEPARTMENT of NATURE EDUCATION

Dr. E. Laurence Palmer
Cornell University, Director

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What's in a Name?

by E. Laurence Palmer

IF ONE read casually that there was a place on this earth of ours where cows after mating with bulls gave birth to pups on a rookery under the supervision of the Bureau of Fisheries one might feel that the writer had seriously muddled things, or at least that there was "something decayed in a certain small west European country." Anyone would know that the offspring of cows and bulls is known as a calf, and that a rookery is a place for birds, and that neither calves, birds nor cows and bulls could by the wildest stretch of imagination be considered as fish. In spite of the seeming inconsistency of the statement, it is applied to a condition upon which General Usage has put his approval. Adult seals are known as bulls and cows. Their offspring are known as pups and their breeding grounds or rookeries are under the supervision of the Bureau of Fisheries.

How far we should permit the edicts of General Usage to make inroads on what we know to be proper usage of words is a debatable question. Certainly where one of two common words more accurately describes what we have in mind, we should make at least some little sacrifice to use the more definite term. At least one of the larger juvenile organizations well known throughout the country requires for advancement, information on "trees or plants." It would seem that anyone would know that a tree was a plant and not an animal, and, therefore, that the two terms used were certainly not mutually exclusive. If brevity is the spice of life the requirement would have been spicier and at the same time more accurate to have appeared merely as "plants". "Woody plants and herbs" might have expressed the idea in mind if it were essential to be verbose. One hates to think of introducing definitions into a Nature Education program but it seems that they would not be out of place in giving a popular and yet scientifically accurate interpretation to such words as plants, animals, reptiles, stars, bugs, insects and the like.

The use of the expression "birds and animals" is, I believe, essentially American. Whether the substitution of the word animal for the word mammal dates back to the time when we used the term limb instead of leg I cannot say, but it has been suggested by a correspondent that false modesty was the motive behind each of these substitutions. In these days when we pride ourselves justly on having freed ourselves from some of the absurd prudery of the past we have not even the flimsy excuse suggested above for substituting "animal" for "mammal". One organization interested in Nature work uses the term animal for mammal. I have seen a candidate for advancement in that organization refused recognition because knowledge of snakes and insects was offered to meet the requirements set for "animals". If we pride ourselves on calling a spade a spade let's also pride ourselves on calling a mammal a mammal.

The writer has been interested in the establishment of a certain "wild life sanctuary". A committee of business men interested in the financial phase of the problem met recently. One of them insisted that in the publicity the term "wild life" be defined. To him "wild life" suggested Chicago. Certainly if the public generally had the idea that we were trying to establish a sanctuary for the "wild life" mentioned in the papers as being typical of our big cities, we might justly have been accused of raising funds for purposes other than those advertised. Undoubtedly the term "wild life" has a dual meaning. Unquestionably there are wild birds and wild mammals, other than man, that show more of kindness, more responsibility in home relations and more general consideration for the other fellow than some of the "wild birds" belonging to the species *Homo sapiens*. The Indians tell us that the name Manhattan means "where we drink rum". Possibly this early designation of the heart of our metropolis has something to do with the confusion attached to the meaning of the word "wild".

When the Pittsburgh baseball team won the world's championship a few years ago, an enthusiastic newspaper writer described the team as a "constellation of planets". If he meant that the players on the Pittsburgh team were brilliant "stars" brought together in a constellation, his simile might have been apt but when he slipped over and called the team a "constellation of planets" he offered merely another argument for requiring a course in Nature Education in the preparation of newspaper writers.

Accidental use of terms not understood by the users is much more easily forgiven than the failure of organizations to live up to ideals expressed by the names they have selected to represent them. At a recent dinner to "sportsmen", a chief "game protector" of a powerful "conservation" organization outlined with glee a shoot-

(Continued on page 273)

HINTS AND HELPS FOR *HOME and GARDEN*

APRIL

by
Thomas Sheward

SOW primulas for the window garden, this month, to flower next winter. The best sorts are *P. senensis, P. obconica,* and *P. malacoides.* Use sifted moss to cover the seeds, as it holds moisture and helps germination. Also sow cineraria and Christmas cherry now. Root cuttings of shrubs in water. Many of these will flower in pots, especially the guelder rose, which grows easily from cuttings. Azalea cuttings can be rooted in pots of peat and sand, as soon as the new wood is well ripened. These make nice plants for small pots in two years. Freesias flower in a few months from seed. This is the best time to sow for flowering in December and January. They can be grown outside in pots or boxes all summer, and will flower in the window garden in winter.

In the May issue of Nature Magazine garden lovers will find an interesting and practical article on the peony and its propagation. It is one of the series of useful articles for the gardener.

It is not out of place here to call attention to the special Garden Photograph Contest. See the January issue, Page 45, or send for details, then get your camera.

* * *

Where there is a shortage of flower pots for geraniums and other bedding plants, or for tomato plants that are to be planted out next month try moss instead of pots. The moss is tied around the roots, and the plants set close together in boxes; then, at planting time the roots are dipped in manure water, before setting out. Plants treated this way transplant easily, and will stand a dry season much better than when planted from boxes.

* * *

Manure water is a great help in the garden. A good tank for this purpose can be made from an old gasoline tank, as illustrated, and when painted, will not be noticed if placed in a corner of the garden.

* * *

In the northern states, prune roses; make new plantations of raspberries, strawberries and asparagus; uncover vines laid down for the winter, and tie to the supports. Start hotbeds for half hardy annuals, such as asters, stocks, zinnias, and so on, and sow all hardy vegetable and flower seeds. Uncover bulbs, protected for the winter, and finish all pruning.

* * *

In the south, Oregon, and Washington, sow succession crops of vegetables for late supply, stake peas, begin to disbud sweet peas, and remove tender annuals from the hotbeds to cold frames and shelters ready for planting out in May.

* * *

Plant gladioli this month, for early flowers, and in batches till the end of June for late cutting. The best way to get a supply of these useful bulbs for your garden is to plant the bulblets. They flower first year and are not expensive.

* * *

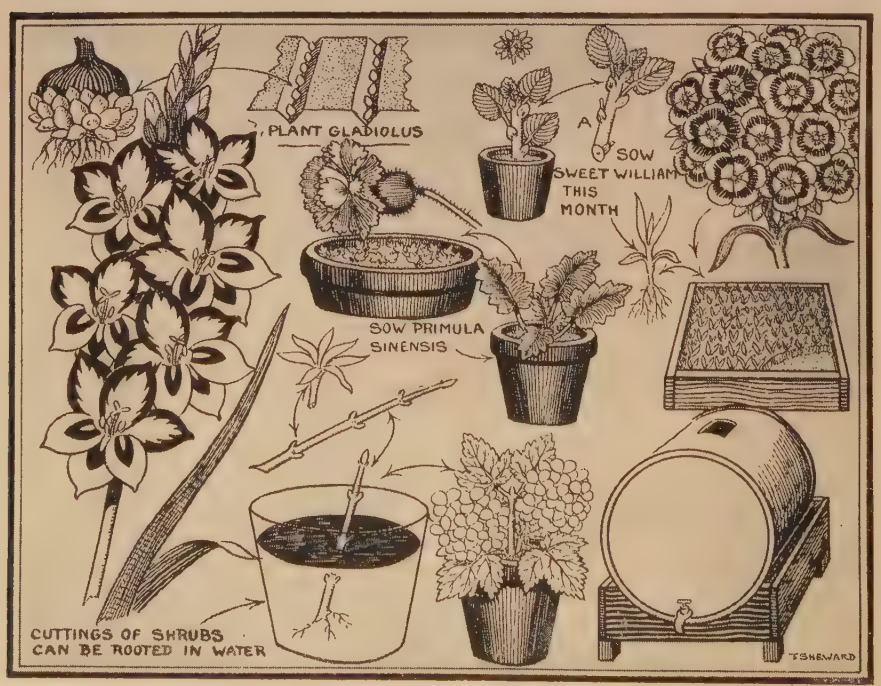
Geranium cuttings taken now and potted firmly will flower all next winter, if the flowers are removed. Sow sweet william, canterbury bells, hollyhocks, and delphiniums now, to flower next year.

* * *

Propagate peonies now by box layering. If you have a good variety you wish to propagate, place a bottomless box around the plant, as illustrated, fill with fine soil, and when the box is removed the following spring. buds will have formed in the axil of the leaves, and these are cut away, and planted. This method is used only when large quantities of plants are required; propagation by division is best for only a few plants.

* * *

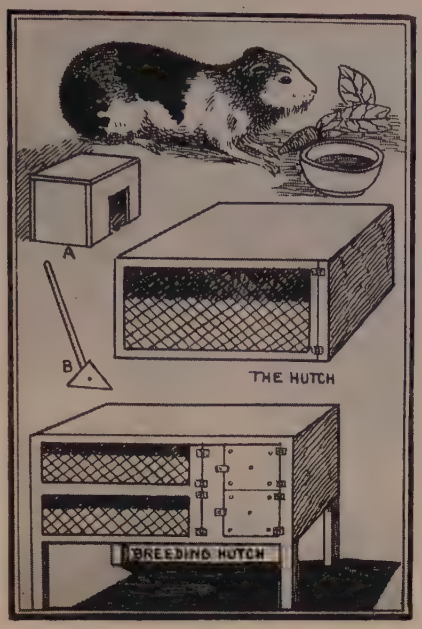
Plants growing in the Wardian case will require more ventilation as the days grow warmer,



and should not be exposed to strong sunshine. It is a good time now to sow seed of rock plants, and to make new rock gardens.

* * *

This is the month for canary breeding. Clean out the breeding cage and place inside plenty of material for nest building, such as moss and dried grass. Nesting boxes or cups are placed near the perches, and not too high up in the cage,—about level with the perch is best. If the birds make a nest on the floor do not disturb them, as they usually refuse to take to the nest if moved. Remove the eggs each morning and store in bran till there is enough for a setting. It is 14 days from the time the hen takes to the nest till the young birds are hatched. A few days before the eggs are hatched, dust them with insect powder, to keep down red mite or canary bug, also dust the nest after the young birds are removed, and before the hen begins setting again. The food for young birds consists of hard boiled eggs, crushed very fine and mixed with wheaten bread. This is passed through a fine sieve, which is always scalded after using. When the young birds are three weeks old the hen will begin laying again, so the young are removed to a separate cage.



* * *

Guinea pigs are favorite pets with children, and in the colder sections of the country are kept in a warm shed during the winter. Remove to hutches outside this month, and place the females in the breeding hutch. If there is no proper breeding hutch, a box placed in the ordinary hutch will do just as well. Give plenty of water during the breeding season, also fresh green food, and roots. The females must not be disturbed when breeding, or they will destroy the young.

* * *

When cleaning windows, use ammonia in the water instead of soap, for best results. Three tablespoons full to a pail of water is the proper quantity to use.

* * *

Ammonia is also used to remove paint from clothing, and to remove fruit stains. Half turpentine-half ammonia solutions may be used.

* * *

To clean wash leather gloves, place in a mixture of hot water and permanganate of potash for half hour. Five grains to a cup full of hot water will dye them a good brown shade.

To drive away rats, place camphor gum in a cloth soaked in kerosene, and plug into the holes. Red pepper or snuff sprinkled near the holes will drive away mice and crickets.

* * *

To mend china, use pulverized alum melted, and brushed over the broken parts. This will set firmly so that it will not come apart when washed in hot water.

* * *

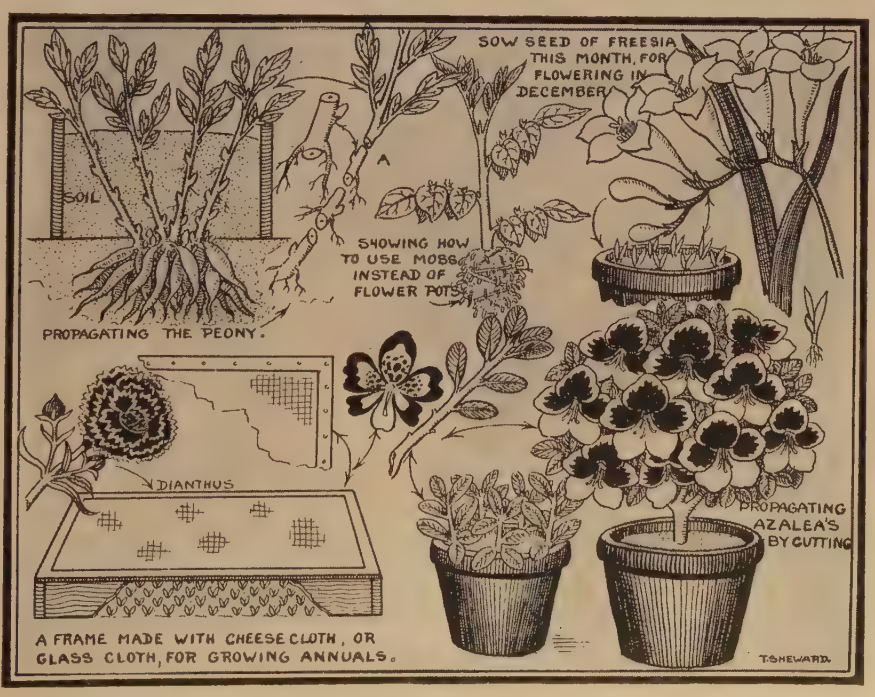
Miss Lena Artz of McGaheysville, Virginia, contributes a garden experience which we feel will be of interest to many readers of this department.

"Under an old, low-hanging apple tree in a corner of the garden," she writes, "I have a wild flower garden. It is my custom each year in late summer to cover this spot with a good supply of half-decayed and dried leaves. In the autumn of 1926 I got my supply of leaves from a place in the woods where edible mushrooms grow. In the spring of 1927 I had a crop of twenty-two mushrooms. I left some of these for this year, and, in addition, I scattered some other mushrooms in which the spores were well-ripened, on this spot. As anyone knows who has eaten them, these mushrooms,—morels,—are delicious and I am looking forward to my 1928 crop."

Perhaps there are others who have a location in their garden admirably adapted for raising such satisfying crop.

* * *

In connection with the above suggestion readers should not overlook the second article in this issue on Soil-Testing for a Wild Flower Garden. Such a garden is an interesting complement to a "tame flower" garden.


SOW SEED OF FREESIA THIS MONTH, FOR FLOWERING IN DECEMBER
A
SOIL
SHOWING HOW TO USE MOSS INSTEAD OF FLOWER POTS
PROPAGATING THE PEONY.
DIANTHUS
PROPAGATING AZALEA'S BY CUTTING
A FRAME MADE WITH CHEESE CLOTH, OR GLASS CLOTH, FOR GROWING ANNUALS.
T. SHEWARD.

Scott's Creeping Bent

Makes Lawns Like Velvet

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Nature Guide School

The demand for trained Nature leaders to superintend Nature work in public and private schools, on playgrounds, and in summer camps has found another response in the creation of a summer "Nature Guide School" through the cooperation of the Senior Teachers' College of Western Reserve University and the Cleveland School of Education. The course is under the direction of Dr. William Gould Vinal, Director of Nature Guiding of the American Nature Association, and head of the Department of Nature Education at the Cleveland School of Education.

The school is situated in the midst of a 500 acre wild life sanctuary, rich in flora, fauna and fossils, on the campus of the Western Reserve Academy at Hudson, Ohio, twenty-five miles from Cleveland. Near it are the famous Indian mounds, the Twinsburg formation, fox, pheasant and dahlia farms, tree nurseries and fish hatcheries. It will accommodate, during its six weeks' course, one hundred and fifty Nature students, who, after fulfilling stipulated requirements, will be given the status of "Nature Guides".

In addition to the regular Nature courses, conducted under the direction of recognized naturalists and scientists, supplementary training is to be supplied through laboratory work and extensive field investigation. Wide recreational opportunities make it possible to develop, in accordance with the ideals of the school and its director, healthy attitudes and widened interests.

Among the courses presented are handcraft involving use of the woodshop, photographic darkroom and paint shop; field geography, which will utilize the surrounding country; and studies of local flora, trees and birds. In 1929, advanced work in physiography, gardening, insect study, and study of non-flowering plants will be included. Credit given for the courses is acceptable toward the Ohio State certificate, and toward the degree of Bachelor of Education. Three aspects of Nature knowledge are treated—the academic, the professional, and the recreational.

One of the features of the school is the "Outdoor Girls", a group limited to twenty-five members from ten to fifteen years of age, who, under the direction of Miss Estelle M. Beenell, assistant professor of the Group Work Training Course at Western Reserve University, follow the program of their elders in handcraft and Nature study, and, additionally, are taught care of domestic animals, dairy procedure, orcharding, and general farm duties. The Outdoor Girls will have the recreational advantages of the summer camp as well as opportunities for early developing leadership, both Nature-wise and social, a creative spirit, and physical healthiness.

Miss Harriet S. Cutter, at Senior Teachers' College, 2060 Stearns Road, Cleveland, is the registrar, and will supply information and application blanks both for the Nature Guide school and membership in the Outdoor Girls.

Col. Greeley Resigns

Col. William B. Greeley, since 1920 chief of the Forest Service, and during the war, head of the forestry section of the American Expeditionary Forces resigns from his post the first of this month, to take a position with the West Coast Lumber Manufacturers' Association, according to an announcement by Secretary of Agriculture Jardine. His place is to be taken by Major R. Y. Stuart, now assistant forester in charge of public relations.

In accepting the resignation of Col. Greeley, Secretary Jardine said: "It would be impossible to overstate the high character of the service that Col. Greeley has rendered to the American people. He has given his services for 23 years, and risen, due to his ability, to the head of an organization which administers more than 150,000,000 acres of Federal land. He has made a permanent place for himself in the public esteem and in history."

During the war, Colonel Greeley was given distinguished service awards from England and United States, and made a Chevalier of the Legion of Honor of France. Major Stuart, who succeeds him, first entered the Forestry Service in 1906, and at different times was U. S. Forestry inspector, deputy commissioner of forestry in Pennsylvania, and secretary of the Pennsylvania Department of Waters and Forests.

Mammal Artists Exhibit

An exhibition of the work of the American mammal artists will be held under the auspices of the American Society of Mammalogists at the U. S. National Museum in Washington, April 1 to April 15. Workers in all mediums are invited to participate by E. R. Kalmbach, chairman of the arrangements committee, at the Biological Survey, U. S. Department of Agriculture, who advises that the closing time for contributions is March 24. No pictures larger than 30 by 40 inches will be acceptable. The pictures will be constantly guarded in the new fireproof National Museum building, Mr. Kalmbach states. Special care will be taken of all exhibits, although the society will not assume responsibility for possible loss or damage.

Wild Flower Lovers

Frank Yeingst, whose address is R.D.#2, Gardners, Pennsylvania, wishes to exchange wild flowers with other collectors, and would like to hear from *Nature Magazine* readers who live in vicinities where the yellow and white moccasin and lady-slippers grow.

Rabbit Experiment Station

A United States Rabbit experiment station, the first of its kind in the country, which will be maintained by the Division of Fur Resources, in cooperation with the National Rabbit Federation and local rabbit breeders, has been opened under the direction of D. Monroe Green of the U. S. Biological Survey at Fontana, California.

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Massachusetts Aroused

In an effort to drive the "roadside town" back into the simple, contiguous Massachusetts colonial village, from which it spread to take advantage of the tourist trade, and to prevent the marring of the scenery along motor trails, once famous Indian routes by a "Metropolitan invasion of Commerce", organizations in the Bay State, led by the Massachusetts Forestry Association, are seeking the passage through the General Court of a bill which will empower the commonwealth to "zone" the state highways, in the same manner as cities zone their streets.

This proposed bill, which follows directly in line with the "Outdoor Good Manners" ideal sponsored by the American Nature Association, will, if passed, eventually bring back to quiet and naturalness rural sections of Massachusetts, according to those supporting the measure. It will release the countryside from the bondage of those who take advantage of man's and motor's feeding proclivities. The bill will meet a serious situation now existing, in the opinion of Harris Reynolds, secretary of the Forestry Association, who says:

"Just now we are at the cross roads. Either we are going to retain the beauty and the charm of New England waysides, or they are doomed to become commercial slums. A few more filling stations for man and motor, and the wayside environment of colonial New England will have followed the Indian wigwam over the last pass."

Walton League Convenes

The fifth annual National Convention of the Izaak Walton League, to determine future conservation policies and programs, will be held in Omaha, Nebraska, April 19th and 20th, Fred H. Doellner, general manager, announces. One of the features of the convention will be the National Sportsman show, at which a complete collection of outdoor equipment will be exhibited. The Waltonians are still pointing toward their expansion program.

The League this year is supporting conservation legislation characterized by Seth E. Gordon, conservation director, as "the most comprehensive and important which has ever been under the consideration of Congress at one time." Chief among the bills are the McNary-Woodruff forest purchase bill, for a $40,000,000 national forest acquisition program in the eastern states; the Hope Cheyenne Bottoms Bill, to appropriate $350,000 for a 25,000 acre lake and water fowl refuge in Kansas; two haylands bills, for the winter feeding of elk in Jackson Hole and Northern Yellowstone Park, and the Potomac Falls bill, which is designed to bring the Great Falls of the Potomac and surrounding land under public ownership as a park.

ROSE BUSHES

Two- and three-year old $3.95 per doz.; $27.00 per 100. Postpaid Insured Delivery.

Souvenir De Claudius Pernet, Rapture, Mrs. F. R. Pierson, Silver Columbia, Templar, Commonwealth, Ophelia, Columbia, Madame Butterfly, Premier, Double White Killarney, America. Bloom from these bushes won first prize at the International Flower Show, New York City, four years in succession, 1924, 1925, 1926, 1927.

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Gay Morning—Very fine Decorative, bittersweet orange suffused salmon. Large. $5.00

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White Rock—A very large, white decorative slightly tinted pink. 1.00

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Flowering Water, Bog and Upland Plants. 40 plants and shrubs that attract wild birds, fish and animals. Plant now. Suggestions and prices free. Write

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Census Takers Wanted

The Biological Survey of the United States Department of Agriculture has issued a call for volunteer bird students to participate in a nation-wide bird census by listing by species and number the feathered creatures nesting in areas near their homes. Birds in all districts,—farmlands, river and lake shores, city parks,—are to be enumerated. Those willing to rise early on June mornings to take part in the count are asked to communicate with the Biological Survey, Washington, D. C.

Ancient Lake Discovered

A giant natural rain gauge, similar to those existing in the desert regions of California and Nevada, and showing by its high and dry wave-cut beaches the record of the last rainy period of the Great Ice Age, has been discovered in Kenya Territory, East Africa, by Erik Nilsson, a Swedish geologist. The African example, like the others, is a deep valley without outlet, and contains three small lakes, the tiny remnants of a much greater expanse of water. The beach is six hundred feet above the valley floor. The discovery proves, it is claimed, that greater rains poured down on the earth during the period of the Ice Age than do at present.

Balboa Park Museum

Indicative of the public interest in Nature are the facts disclosed by the annual report of the Natural History Museum, in Balboa Park, San Diego, California, which states that over 6500 persons attended their 16 spring lectures, and 2800 individuals took part in their 32 Nature trips conducted last year throughout the state. More than 1900 college and public school students from 69 institutions were provided with special instruction.

Camp-Fire Camp Grows

To meet the increased demands for summer camping among girls and young women from New York and New Jersey, Camp Onika, the Camp-Fire Girls' summer haven in the Harriman State Park, is to be enlarged to include three complete standard camping units, with dining and recreation halls, sleeping cabins and other facilities. It will accommodate in June, when its new facilities will be completed, about three hundred girls and leaders at one time.

Chestnut Blight Spreading

The United States Department of Agriculture warns owners of chestnut timber immediately to consider salvaging their trees suitable for poles and tannic acid manufacture, in view of the fact that the chestnut blight, a fungus growth, is continuing to spread rapidly through the Southern States. All but 14 of the chestnut producing counties of Virginia have 80% or more of the trees infected or killed, and other states have been invaded similarly.

Invest in Better Rest

WHEN the fading twilight beckons your boat toward shore, there's two wonderful things waiting in your cabin or lodge—the fried fish supper and the evening of rest and relaxation.

Thousands of sportsmen look forward to their evening's rest in Rustic Hickory Furniture. They have enjoyed this perfect rest season after season, for Rustic Hickory is lifetime furniture—as well as the acme of comfort and beauty.

Rustic Hickory craftsmen have fashioned this unique furniture from the choicest Northern hickory for over a quarter century. Made in 130 different styles, it is the ideal furniture for all summer places, inside and out, and for all porches, whether country, urban or resort.

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Fossils Form Rock

The National Park Service of the U. S. Department of the Interior has discovered near the top of the Taki Point section of the Grand Canyon of Colorado a strip of solid stratified rock, nearly one foot thick, and composed almost entirely of millions of tiny skeletons of extinct shell fish, known as Producti. These fish were laid down, it is believed, under sections of the Kaibab limestone during the Carboniferous period, when the present top of the canyon wall, now 7,000 feet above sea level, composed a part of the shallow ocean floor. These tiny fish, now fossilized, thrived for a short geologic time, and ended their struggle for existence shortly before the close of the Paleozoic era.

Yosemite Birds Listed

A distribution list of more than 170 species of birds found in Yosemite National Park has been compiled by Mrs. Enid Michael, a Nature guide in the Park, and C. E. Michael, her husband, with the assistance of records previously collected by Joseph Grinnell, Donald D. McLean, and H. C. Bryant. The list places the birds in their natural habitat, concerning which Mrs. Michael writes: "In many species the degree of sensitiveness (to external conditions) is so great that the birds can exist only within a relatively narrow range of climatic and flora changes. The student is led to the conclusion that the factor of temperature has most to do with the causation of life zones, which are fairly well marked."

Tree Society Progresses

Calaveras Grove Association, formed last year in Stockton, California, to achieve the transfer to state park status of 6,000 acres of privately and nationally-owned timber land comprising the North and South Calaveras Groves and the intervening strip along the North Fork of the Stanilaus River, have progressed considerably toward their goal, their annual report states. The U. S. Forest Service and private owners have proved approachable, and a bill is in Congress at present to allow the government to cede its holdings to the state. It is estimated that $900,000 will suffice to purchase the tract. The association is also supporting plans for a $6,000,000 bond issue for state park purchase, to be submitted at the next general election for popular referendum.

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Enjoy the thrill of seeing your new shoots develop into beautiful blossoms to last all summer long.

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Mountain Park New Mexico

Visiting Robins Saved

Through the prompt action of sportsmen and business men of Asheboro, in Randolph County, North Carolina, great hordes of robins, who came to roost this January in the cedar thickets near a mountain stream, have been saved from wholesale slaughter at the hands of marauders, who were making night raids on them. These friends of the birds brought attention of the killings to members of the state game commission and game wardens, and an awakened public opinion helped to bring about a cessation of the destruction. The flight cloud of the robins as they came to settle in the thick undergrowth was described as being more than fifteen miles long and a mile wide, and moved at the rate of thirty miles an hour for more than thirty minutes. The raiders, during the two nights they were active, succeeded in destroying hundreds of birds.

Bird Society Domiciled

The Agricultural Society of America, formed for the study of foreign birds, their breeding, feeding, and perpetuation, who held their first meeting recently at the Columbia Club, in New York City, have opened permanent headquarters at Room 1426, 15 Park Row, New York, N. Y.

Boston Society Elects

Charles H. Taylor has succeeded Dr. Thomas Barbour as president, and Dr. Edward Wigglesworth has taken the place of William A. Jeffries as treasurer of the Boston Society of Natural History, following the resignation of the two officers recently. Dr. Barbour has become Director of the Harvard University Museum.

Ecologist Transferred

Dr. Arthur P. Kelley, formerly assistant professor of Botany at Rutgers University, has recently become associate ecologist of the Allegheny Forest Experiment Station at Philadelphia, where he will study timber-growing. Dr. Kelley was the first field man of the Edison Botanical Research Corporation in Florida, and has done considerable ecological research. He is Fellow of the American Association for the Advancement of Science.

Farming the Antarctic

That future generations of Australians may farm the Antarctic Ocean, densely populated with fish, almost as men farm the soil was predicted by Sir Douglas Mawson, Antarctic explorer, in a recent address. Rich developments may be expected from this large ocean expanse, from which only whales have been taken, he said, and with scientific development of methods of utilizing the seas as places for the growing of food, the southern half of the earth will find a great asset in its now-useless sea.

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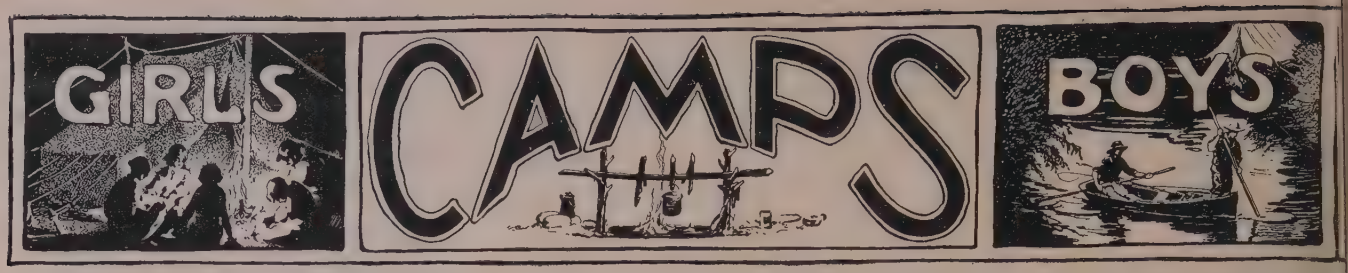

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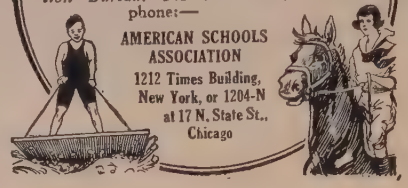

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Further information about Chalfonte-Haddon Hall is interestingly given in booklet form. We would be glad to mail you a copy.

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Are Ants Democratic?

Discoveries that the caste system of social insects is not totally fixed, and that individuals may move up and down in the social scale, much as in a human democracy, have recently been made known by the Wistar Institute Bibliographic Service, following the findings of Dr. W. M. Wheeler of Harvard University, and Mr. Harold Heath of Pacific Grove, California. Dr. Wheeler found that an infection of tiny nematode worms, similar to hookworms, may produce from ant larvae a caste different from those of workers, soldiers and queens. Mr. Harold Heath's experiments have disclosed that among the white ants or termites not all of amazon-soldiers are barred from laying eggs, but that some process, believed by him to be the result of special diet, transforms termites with soldier bodies into egg-laying creatures.

Trees and Water

How great trees have lifted the water necessary to their existence to their highest branches, though atmospheric pressure will raise water only thirty-three feet, has long been a puzzling question to scientists. The answer, however, in the opinion of Prof. Burton E. Livingston, of Johns Hopkins University, is that the water is pulled up by virtue of its own cohesive forces, through tiny tubes within the tree. Forces of more than 150 pounds to the square inch are overcome by this tendency of the molecules of water to cohere, and the tiny waterways help to prevent a breaking of a complete water column which is necessary for the upward progress of the moisture.

Wind Foils Science

The government of Palestine, bothered since early historic times with the locust, long famous as one of the scourges of Egypt, has been foiled in its plans to try out a new weapon—a flame gun—on the insect hordes. Just when scientists were ready to descend on the pest that for fifty centuries had wrought havoc with the crops and peace of mind of the country, a wind sprang up, which drove the creatures out into the desert. So the flame guns, which discharge long jets of devastating fire, must stand useless until a more favorable day, when the locusts again attempt their invasion.

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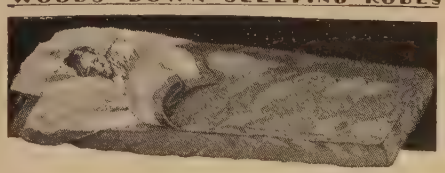

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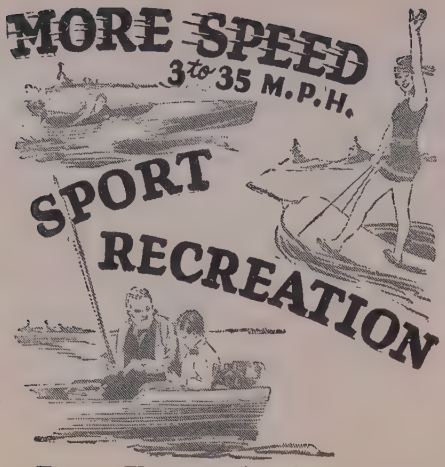

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Mammal "Who's Who"

A new Natural History dealing with the world's mammals and described as "an illustrated who's who of the animal world" is being brought out in this country by the Macmillan Company. The author is George Jennison, M.A., F.Z.S., and the object is to provide a handy book of reference on the kingdom of mammals. The object seems to have been accomplished. The text is prepared distinctly for reference purposes and is profusely illustrated with more than three hundred reproductions from black and white photographs and sixteen fine color plates by E. H. Fisher. It is a most valuable volume and is listed at $4.50.

Classroom Teacher

Two volumes in the set brought out under the title *The Classroom Teacher* by The Classroom Teacher, Inc., of Chicago, are of special interest to Nature and Science teachers. Volume Five, the first third of which is devoted to health education, gives the bulk of its contents to primary science under the editorship of Gerald S. Craig of Columbia University. Volume Nine is edited by Elliot R. Downing of the University of Chicago and is devoted to plant and animal societies. Leaders in the field of Nature Education have contributed to this volume, and, beside being well illustrated in black and white, it contains a number of excellent color plates. Judging by these two volumes, the entire set is a valuable school text for reference work and teaching use.

Our Wild Animals

Edwin Lincoln Moseley is the author of a new publication by D. Appleton and Company entitled *Our Wild Animals*. It is a well-illustrated and popularly presented volume on the more common mammals of the United States and is a combination of personal observations and compilation of the findings of authorities. The volume seems admirably adapted as a school text, either for class use or supplementary reading. It is listed by the publishers at $1.75.

Nature Poetry

"It seems to me that the distinction between prose and poetry is akin to that between reason and intuition, between seeing things step by step and seeing them more at a glance," writes Charles William Hetzler. This thought moves him to express his love of Nature in rhyme, these poems making up the major part of his volume *Lines of Thought*, published by the Stratford Company, Boston, Massachusetts. Mr. Hetzler senses the realm of the wild with combined affection and understanding and transmutes these qualities into attractive verse.

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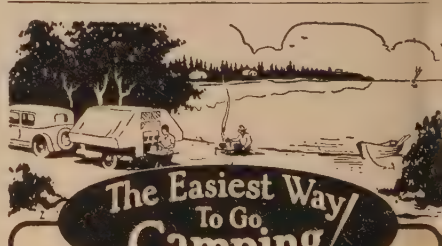

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In Carlsbad Cavern

Those who found our recent article on the great caverns of Carlsbad, New Mexico, a fascinating introduction to this wonder of Nature will be specially interested in the new story of Carlsbad by Vernon Bailey brought out by Williams and Wilkins of Baltimore under title *Animal Life of the Carlsbad Cavern.* The flora and fauna of the region of Carlsbad is varied and interesting and few know it better than Mr. Bailey. Not only does he write of the caves, —the most spectacular yet discovered in this country,—and the life they contain, but he acquaints the reader with the environment of these caverns, from the wild life point of view, in the Pecos River Valley. It is a fine volume, scientifically, popularly and photographically. It sells for three dollars.

On Fur-Bearers

The Fur-Trade of Canada, by H. A. Innis, Assistant Professor of Political Economy of the University of Toronto, published at Toronto, Oxford University Press, 1927, is the first of a series of studies dealing with the chief industries of Canada. It is one that carries a lesson for the Nature-lover and conservationist. In this book Dr. Innis has traced, by the aid of the cold light of historical facts and figures, the rapid decline of the fur-bearers of the world. This decline is shown to be progressively swift, a constantly dwindling supply accompanying an increased demand. The scarcity of a particular species due to over-exploitation results merely in an increasing pressure on others. The probability of increasing the supply through restrictive legislation, or by fur-farming, is very slight. There is no prospect of a cessation of the destruction.

The study is wholly from the standpoint of an economist, and in it sentiment, properly, plays no part. But shall the Nature-lovers and the humanitarians of North America gain no lesson from its recital of destruction and waste? Will they passively submit to the progress of this destroying force to its logical conclusion—extermination? In other words, will the women of America continue to allow themselves to be the willing tools of an industry that, with its sister-despoiler, over-killing in the name of sport, is devastating a continent unsurpassed in the richness of its wild life?

Mr. Williamson Again

Another fascinating Nature volume has come from the pen of Henry Williamson, English Nature writer, this time with the title of *Tarka, the Otter.* Mr. Williamson's style is delightful and pictorial. In this latest volume he selects for his wild hero a fellow who travels in lands of mystery and allure. He carries him through many thrilling encounters and experiences where he meets others of his wild world. Mr. Williamson writes of England and English wild life but his writings have international appeal. As in the past E. P. Dutton and Company of New York are his American publishers. This volume is listed at $2.50.

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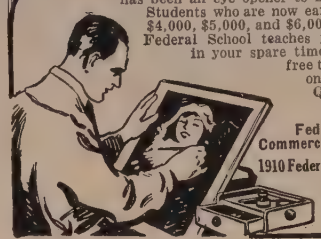

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QUESTION: *Can goldfish be left in an outdoor pool during the winter?—M. H.*

ANSWER: Fish can be left in an outside pool provided that it is deep enough so that when ice forms sufficient water is left to furnish oxygen for them. If there is mud at the bottom, they will remain quiet, and in all probability survive in comfort.

* * *

QUESTION: *I would like instructions for building a gray squirrel house.—G. W. E.*

ANSWER: Squirrels are not particular as to the form of shelter, except that they like the entrance to be some distance above the floor of the house. The entrance should be about 3 in. in diameter, and easily reached. A box about a foot square and from 18 to 24 inches long, placed on end, with the hole near the top, will usually prove suitable. It should be rough inside, and of course have a tight roof.

* * *

QUESTION: *Do squirrels build nests among the branches of tree tops?—H. G. M.*

ANSWER: All our tree squirrels make nests of twigs and leaves among the branches of trees. The gray squirrel usually has its young in a hollow tree, but builds a summer nest of twigs, cut with the leaves on, on a tree branch. These are also often occupied in the winter. They are warmly lined, and roofed over, and have the entrance at the side. Red squirrels make nests of similar shape, but the material is mainly shredded bark and grass. The flying squirrel also builds a warm grassy nest in which frequently the young are born and raised.

* * *

QUESTION: *Will you please inform me of the botanical name of the Spider lily? —M. M.*

ANSWER: The spiderwort, *Tradescantia virginica,* is called "spider lily" in some parts of the country. It is a pretty plant with a three-petaled blue flower.

* * *

QUESTION: *Where does the tomato "worm" go in winter? Does he make a cocoon?—A. B.*

ANSWER: When the caterpillar you speak of has completed its growth it becomes darker and finally a dark brown. It then burrows deep into the earth where it forms a chamber, sheds its skin and becomes a chrysalis. It forms no cocoon since it is protected in its underground cell from dryness and enemies. In late spring or early summer the chrysalis works its way to the surface and becomes a moth.

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Nature Education

(Continued from page 259)

ing event in Europe in which "seven guns in six days killed fourteen thousand Hungarian grouse". I was glad to see dismay registered on the face of more than one of the listeners and know that the event which I was attending was not a meeting of the "Butchers of Wild Life, Inc". Strange to say, the conservation organization involved in this particular case is spending much money in attempts to introduce foreign game birds to which it proposes to give "adequate protection". At the same time, it permits one of the most glorious of game birds, the ruffed grouse, which happens to be native of the state, to be shot through comparatively long seasons until it is now in danger of local extinction.

It is the hope that as time goes on Nature Education may develop a public that speaks of things in Nature with reasonable scientific accuracy and that expects of its institutions truth in advertising so that it is unnecessary to be looking continually for the well known Ethiopian in the accumulation of combustible matter. As evidence that this article is not written in a "holier than thou" spirit, the writer is glad to call attention to the fact that he himself "slipped" in his Nature Calendar in the February Nature Magazine and spoke of "wild animals and birds".

* * *

Leaves Day-Laborers

Leaves will not continue photosynthesis during the evening hours, even though supplied with light, according to E. J. Maskell, English scientist, the results of whose experiments were given by him in a report to the Royal Society in London, England. Using a cherry-laurel tree as a subject, Mr. Maskell discovered that the microscopic holes in the epidermis of the leaf shut tightly thus preventing the absorption of carbon-dioxide once night fell, even though artificial illumination was supplied.

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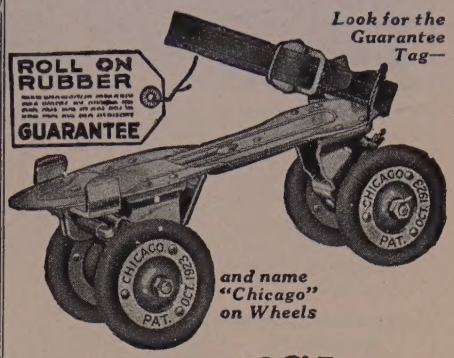

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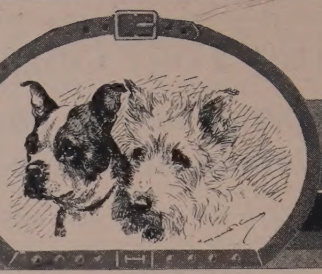

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Tree Planters Preparing

Making Plans for American Forest Week Beginning April 22

Another American Forest Week finds the tree planting army again in the field. Much planting has been done and during the week of April 22 much more will be done. During the WEEK attention will be turned to the educational phases of the national program.

In anticipation of this the American Tree Association at the direction of Charles Lathrop Pack has printed the twentieth edition of the Forestry Primer. This makes the total two million copies. There has been printed a special service edition for members of the American Nature Association and this is being mailed.

The bulk of the distribution has gone to schools of the country and thus thousands upon thousands of the coming generation are learning something of the forestry situation. In addition the American Tree Association has awarded prizes for the best forestry cartoons. The first prize winner is being distributed to schools and women's clubs for display. The second and third prize winners appear on this page. The American Tree Association will send tree planting suggestions to committee heads and will register all tree planters on its national honor roll.

In summer camps forestry study is being included in the program. Development of a forestry program for boys and girls in Iowa started when two forestry schools were conducted in connection with one of the Boy Scout summer camps. As usual the women were watching for anything new to broaden their program, and several girls' 4-H club camps took up the studies. Some question arose as to the type of activity which might be outlined for girls. The decision reached was that, if they wanted the work, they should "take it straight", as planned for the boys, and they took it enthusiastically, I. T. Bode, extension forester reported. Twenty-six schools were conducted in as many boys' and girls' summer camps. Over 1400 boys and girls and 100 adult leaders took the work. Summer camp schools led to a series of studies given at the junior short course at Iowa State College and some 2,000 boys and girls took forestry along with their other courses. This, in turn, has made it possible to prepare and introduce into regular farm club programs another series of forest studies.

"Weakening" *(above) is the second prize winning cartoon by Floyd Gottfredson of Richfield, Utah.* "The Shadow" *(below) is by Richard W. Tupper of Washington, D. C. It won the third prize in the national contest conducted by the American Tree Association.*

One fine example of community effort is the planting of eight thousand trees by 150 Boy Scouts and men of Herkimer, N. Y., on the new East Herkimer Fish and Game club tract. The reforestation expedition was sponsored by the Herkimer Exchange Club to promote greater interest in tree planting. B. D. Gilbert, farm bureau manager and Scout Master Darlington were in charge.

As a result of the efforts of Robert Chilson, 2,000 pine trees have been set out on the land surrounding Camp Kiwanis near North Adams, Mass. Camp Kiwanis is a hike camp for the scouts.

The state of Vermont through its forest service has planted 100,000 trees on the Calvin Coolidge state forest in Plymouth. A planting of 25,000 trees had been made on the Ainsworth forest park, the gift of Miss Mary Waterman to the state. In addition to tree planting, the forest service is distributing information, in cooperation with the Vermont Forestry Association and Prof. K. R. S. Flint of Norwich University.

Planting of 1,000 evergreen, elm and maple trees featured a program at the Conant Street Park under the supervision of the Danvers, Mass. Women's Association.

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